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**A Multicentre Case Study of Evidence-Based Decision-Making:  
Exploring the Process of Knowledge Mobilisation in NHS  
Orthopaedic Practice.**

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A thesis submitted in partial fulfilment of the requirements for the  
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I would like to dedicate this thesis to James and Rex Meredith who became my family along the way.

## Declaration

All material contained in this thesis is the candidate's own work. The thesis has not been submitted for a degree at another university. The author has published the following articles which are linked to the research. A copy of each can be found in the appendix:

*Grove, A., Johnson, R., Clarke, A., and Currie, G., 2016. Evidence and the Drivers of Variation in Orthopaedic Surgical Work: A Mixed Methods Systematic Review. Health Syst Policy Res. 3(1).*

*Grove, A., Currie, G., and Clarke, A., 2015. The barriers and facilitators to the implementation of clinical guidance in elective orthopaedic surgery: a qualitative study protocol. Implementation Science. 10(1)81 doi 10.1186/s13012-015-0273-6.*

*Johnson, R., Grove, A., Clarke, A., 2017. Pillar Integration Process: A technique to integrate data in mixed methods research. Journal of Mixed Methods Research. In Press.*

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## **Abstract**

### **Background:**

Healthcare policy encourages the use of scientific evidence in clinical practice. The complex reality of practice means that dissemination of this evidence in clinical guidelines is insufficient to change behaviour and reduce variation. This study took a knowledge mobilisation perspective to assess the role of evidence-based medicine in orthopaedic practice decisions for hip replacement surgery.

### **Objectives:**

The research sought to identify where, when and how evidence and knowledge were used in decision-making and how this contributed to variation in practice. It discovered factors which influenced orthopaedic surgery decision-making through an in-depth exploration of real life evidence use in practice.

### **Methods:**

Three in-depth case studies were conducted at NHS hospitals over 12-months. Data collected included 64 interviews with surgeons and NHS staff, observations of day-to-day practice and the collection of 121 supplementary documents. A case study road map method was performed using thematic analysis to generate four themes: individuals, groups, organisations and regulation.

### **Results:**

The findings combined individuals and groups, the organisational dynamics and environmental regulation to provide a nuanced understanding of knowledge mobilisation in orthopaedics. Group level knowledge was crucial in explaining variation to evidence-based medicine, specifically how it influenced organisational capacity and the socialisation of medical professionals. The characteristics of surgeons also contributed to the wider definition of evidence which was important for clinical decisions.

### **Conclusion:**

This empirical study of knowledge mobilisation demonstrated that orthopaedic practice was contingent and mediated at different levels, each of which

contributed to variation. Decision-making was dependent on a range evidence and knowledge sources that were influential across the entire knowledge domain. A conceptual framework was produced to demonstrate how knowledge is mobilised in a highly professionalised organisationally regulated context.

## Abbreviations

ACAP	Absorptive Capacity
AHP	Allied Health Professional
BOA	British Orthopaedic Association
BMI	Body Mass Index
BPT	Best Practice Tariff
EBM	Evidence-Based Medicine
CCG	Clinical Commissioning Groups
CD	Clinical Director
CoP	Communities of Practice
CQC	Care Quality Commission
DH	Department of Health
GMC	General Medical Council
GP	General Practitioner
KII	Key Informant Interview
LPP	Legitimate Peripheral Participation
NHS	National Health Service
NICE	National Institute for Health and Care Excellence
NIHR	National Institute for Health Research
NJR	National Joint Registry
OA	Osteoarthritis
ODEP	Orthopaedic Device Evaluation Panel
OSOP	One Sheet of Paper
PACAP	Potential Absorptive Capacity
PbR	Payment by Results
PROMs	Patient Reported Outcome Measures
RACAP	Realised Absorptive Capacity
RCS	The Royal College of Surgeons
RCT	Randomised Controlled Trial
R&D	Research and Development
RQ	Research Question
SD	Speciality Director

THR            Total Hip Replacement

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# 1 Introduction

*"In medicine, sometimes we think we know better and maybe we don't..."*

*...unfortunately, in my experience there's always a way of justifying whatever you want."*

*(Anonymised surgeon participants)*

This chapter presents the context and rationale underpinning my research, which assessed the role of evidence-based medicine in orthopaedic surgical practice decisions, together with the research questions, objectives and methods. I provide an overview of the findings in the context of knowledge mobilisation and indicate my contribution in understanding variation in NHS practice brought about by the existence and use of different types of knowledge and the wider definitions of evidence that exists. Finally, I describe the structure of this thesis.

## 1.1 Context and rationale

In 2013-2014, my team and I were involved in production of National Institute for Health and Care Excellence (NICE) guidance on hip implants for total hip replacement (THR) for end stage arthritis (NICE TA304, 2014). This provided a golden opportunity to explore the understanding and use of NICE guidance in the context of evidence-based medicine (EBM). I used a specific case of orthopaedic surgery to address the empirical problem of practice variation and variation to guideline uptake through a knowledge mobilisation perspective.

### 1.1.1. Hip replacement surgery

In England, patients who have been diagnosed with severe arthritis of the hip can be offered surgical treatment to help relieve their symptoms, as they often suffer from pain and disability, leading to reduced function and ability to perform daily activities (Clarke et al, 2014). NICE Clinical Guidelines state that referral for joint replacement surgery should be considered for people with these symptoms if they have a substantial impact on their quality of life (NICE CG177, 2014).

In 2015/16, a total of 98,211 hip replacement procedures were carried out in England, in 151 NHS Trusts (247 hospitals) (NJR, 2016). Individual patient characteristics for THR remain fairly stable. In 2015/16, 60% of the primary procedures were carried out on women and the median age at first THR across the entire group was 69 years (NJR, 2016). National Joint Registry data show an increased risk of revision for younger patients (NJR, 2016). This need to replace existing hip implants adds to the increasing demand for services and resources in the NHS. In 2015/16, this 'revision burden' comprised 14.8% of total hip activity (NJR, 2016). This focuses attention on how surgeons select treatments. Revision is a result of 'failure' of the primary operation and an increasing revision burden is anticipated in line with the ageing population in the UK (Briggs, 2012).

### **1.1.2. Evidence of variation in practice of THR**

Nationally, there is inconsistency in the treatment, procedure and type of hip implant used to treat patients, which cannot be explained by differences in patient needs (NHS Atlas, 2016).

The 2013/14 NHS Atlas of Variation reported that for Clinical Commissioning Groups (CCGs) in England, there was a 3.8-fold variation in use of primary hip replacement procedures (range 55 to 208 per 100,000 population) (NHS Atlas, 2016). Even after excluding warranted variation linked to the prevalence of disease, there is still clearly substantial variation in access to hip replacement surgery. There is also variation in timing of referral from primary care to secondary care, in criteria established for undertaking surgery and in patient eligibility criteria (NHS Atlas, 2016). Research has demonstrated that differences exist between the provision of, and the need for, surgery (Judge et al, 2010). Patient reported outcome measures (such as the "EQ5D" five dimensions quality of life questionnaire) reveal that variation between the best (31%) and worst (49%) performing hospitals is large (Appleby and Devlin, 2010). The cost-effectiveness of interventions also varies considerably between hospitals (Appleby, 2010).

More recently, the Royal College of Surgeons of England investigated variation in hip replacement and described a situation that was creating a “*postcode lottery for access to surgical treatment*” (RCS, 2015). In their research, they sampled a group of CCGs and indicated that 73% either did not follow NICE guidance on referral for hip replacement, or had no commissioning policy for this procedure. This variation led to too many or too few referrals. Forty four percent of the CCGs required patients to be in various degrees of pain or immobility (with no consistency across the country) or required patients to lose weight before surgery (RCS, 2015).

Together these studies demonstrate significant variation in the practice of THR as patients in some areas are able to have hip replacements sooner, potentially when they have less pain or disability (Judge et al, 2010), and some will be more likely to experience revision.

### **1.1.3. The research gap**

Research on the views and attitudes of orthopaedic surgeons about treatment selection, surgical methods and intervention types is limited and we lack understanding of their attitudes towards clinical guidance and evidence use in practice. Little is known about how best to influence their behaviour to enhance effective decision-making in the face of the substantial unjustified variation, the increasing demand for hip replacements and the growing revision burden. There is a need to investigate evidence use in practice and in context to determine what factors are important in decision-making.

My study set out to uncover what is required to overcome this gap in our understanding of ‘what works’ for evidence-based orthopaedics. I explored one clinical speciality (orthopaedic surgery) across the NHS in England to address the empirical problem of variation in practice and in guideline uptake, and to explore the theoretical issues on the role of EBM in orthopaedic surgical practice decisions. In particular I investigated the use of THR for treating end-stage arthritis of the hip joint.

#### **1.1.4. Evidence-Based Medicine**

Prior to the development of EBM, reliance on expert opinion and subjective experience were believed to be the approach to medical decision-making. This led to variation in clinical practice, which was known to exist when EBM was first defined (Sackett et al, 1996). The drive to develop EBM was grounded in the belief that changes were needed in the way decisions were made by healthcare professionals. It was assumed that these changes could be achieved by the widespread dissemination and uptake of relevant research evidence in practice (Walshe and Rundall, 2001; Kovner and Rundall, 2006). However, the practicality of achieving this in day-to-day work of orthopaedic surgeons is debatable and variation occurs in practice (Grove et al, 2016). The important questions for my research are how surgeons determine what is appropriate and acceptable evidence for them, and how it is mobilised, adopted and used in practice.

EBM and clinical guidelines make suggestions about ‘what works’ and ‘what does not work’ for patients being treated in the NHS. These concrete and codified sources of knowledge are based on ‘gold-standard’ evidence, such as systematic reviews and randomised controlled trials (RCTs). The premise is that this explicit evidence will provide valid and reliable results which can be generalised into healthcare practice. However, it is difficult to maintain this view of evidence in real world healthcare settings. We need to acknowledge the unpredictable, uncertain and contingent nature of these environments (Pope, 2002), coupled with the knowledge and context-dependent decision-making processes that clinicians go through (Dopson et al, 2003).

#### **1.1.5. Can knowledge mobilisation help understand variation?**

I address the empirical problem of variation from EBM through a theoretical lens. Others have examined EBM in healthcare organisations from a knowledge mobilisation perspective so I draw on this for insight (Dopson et al 2003, Dopson and Fitzgerald, 2005; Crilly et al, 2010; 2013; Ferlie et al, 2012; 2015; Kislov et al, 2014; Oborn et al, 2010; Davies et al, 2015).

There is a perception in healthcare that knowledge and evidence are one in the same (Nutley et al, 2007). In reality, they are contested concepts in both literature and practice (Nicolini et al, 2008). Distinctions are made between tacit and explicit knowledge (Nonaka, 1994). In my study, clinical guidelines are a form of explicit knowledge grounded in clinical science and EBM. They contribute towards, but do not explain all knowledge that influences clinical decisions. Variation occurs in practice when other sources of evidence and knowledge drive decision-making.

Tacit knowledge reflects what we 'know' and is linked to our embedded capability i.e., what we 'do' (Orlikowski, 2002; Nonaka 1994). The weight attached to it is problematic for EBM, where context has been removed from research findings and evidence from RCTs are considered most important (Davies et al, 2000a). In my study, I sought to identify what constitutes evidence and knowledge for orthopaedic clinical-decision makers, and how evidence and knowledge is mobilised in practice. Understanding the context-dependent nature of healthcare was important to explore the differences in the way decisions are made.

Previous research has demonstrated how evidence and objects, people and communities move knowledge inside and outside organisations and across disciplinary boundaries (Contandriopoulos et al, 2010; Cooper and Levin, 2010; Fournier, 2012; Hislop, 2013; Davies et al, 2015). In my research, I use the viewpoint of knowledge mobilisation to investigate how factors spanning the entire knowledge domain interact to produce a system where variation in use and uptake of guidelines exists despite the continued efforts from policy-makers to instil their use in practice.

## **1.2 The research questions**

The overall aim of my study was to assess the role EBM in orthopaedic surgical practice decisions. To achieve this, I developed three research questions (RQ) which cover two areas of science, EBM in clinical science and knowledge mobilisation in organisational sciences. My study of hip replacement surgery

decision-making spans the boundary between these domains. The research questions are as follows:

***RQ1.** What types of evidence and knowledge are considered important by orthopaedic surgeons when making clinical practice decisions?*

***RQ2.** How are evidence and knowledge mobilised in the real-world practice of orthopaedic surgery in the NHS?*

***RQ3.** What are the key dimensions of knowledge mobilisation which influence variation in decision-making in the orthopaedic surgery NHS environment?*

In order to answer these questions, I developed three main research objectives:

- 1 To undertake observations and interviews with orthopaedic surgeons and associated staff working in the NHS in England, and analysis of associated documentation, to identify what types of evidence and knowledge are considered important for decisions-making.
- 2 To integrate the findings from three case studies of clinical practice to develop a framework to understand knowledge mobilisation in the context of UK orthopaedic surgery decision-making.
- 3 To generate themes which summarise where, when and how evidence and knowledge are used in decision-making, and to describe where the mobilisation of knowledge has the greatest influence on variation in practice.

### **1.3 Original contribution**

My research crosses disciplinary boundaries and brings together organisational and clinical sciences to examine knowledge mobilisation in the professionalised environment of orthopaedics. By answering the research questions, I provide an empirical study of knowledge mobilisation using NICE guidelines collected within the orthopaedic departments of three NHS hospitals England. I demonstrate the real world practice of knowledge mobilisation for evidence-based clinical decisions.

The knowledge mobilisation literature in healthcare and other professionalised organisations has tended to focus on, and be explained as a consequence of four

separate levels of influence operating in isolation (Mitton et al, 2007; Nicolini et al, 2008; Contandriopoulos, et al 2010; Ferlie et al, 2012; Davies et al, 2015). In my study, I bring together individuals and groups, organisational dynamics and environmental regulation to provide a more nuanced understanding of knowledge mobilisation. I explain the outcome of particular knowledge mobilisation activities and how and why they lead to variation from clinical guidelines. To achieve this more nuanced understanding, I conducted three in-depth case studies over a 12-month period which included 64 interviews with surgeons and NHS staff. I was embedded in the day-to-day practice of each of the case study hospitals for three months (9 months in total) and I collected 121 supplementary documents to support my analysis.

My study demonstrates that knowledge mobilisation is mediated at different levels, each of which contributes to variation. Group level knowledge was crucial in explaining variation, specifically in how it influenced organisational capacity and the socialisation of medical professionals. The characteristics of surgeons also contributed to the wider definition of evidence which was important for clinical decisions. Together, these findings go beyond previous explanations in the existing EBM and knowledge mobilisation literature. I produced a conceptual framework to demonstrate how evidence and knowledge are mobilised in this highly professionalised organisationally regulated context.

## **1.4 Overview thesis structure**

This section provides a brief overview of the structure of the thesis.

*Chapter one* is the introduction to the thesis. I will address the empirical problem of variation and EBM through the theoretical lens of a knowledge mobilisation perspective (Dopson et al, 2003; Dopson and Fitzgerald, 2005; Crilly et al, 2010; 2013; Ferlie et al, 2012; 2015; Kislov et al, 2014; Oborn et al, 2010; Davies et al, 2015, Oborn et al 2013b), and therefore *Chapter two* presents an overview of the ‘knowledge and knowing’ literature which stems from the field of organisational sciences, and provides theoretical explanations of knowledge and knowledge mobilisation relevant to this research.

*Chapter three* presents detailed research methodology for the case study research, including the rationale, setting, research design and the particular methods chosen.

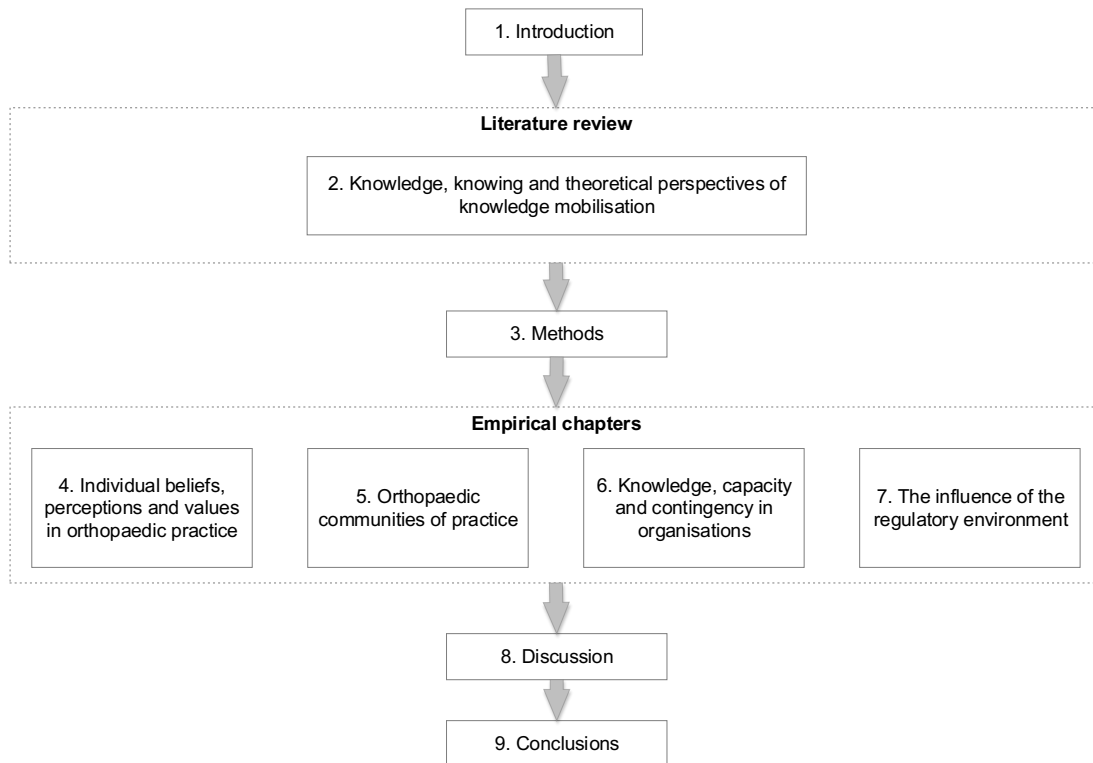
*Chapters four to seven* present the qualitative research results as four distinct levels of analysis. *Chapter four* discusses the findings related to individual beliefs, perceptions and values of the orthopaedic surgeons in practice. *Chapter five* considers the influence of orthopaedic communities of practice on the use of evidence in decision-making. *Chapter six* reviews the knowledge, capacity and contingencies that existed in the three hospital organisations. These were the main factors which influenced evidence use and knowledge mobilisation in my study. *Chapter seven* discusses the influence of the regulatory environment in which the three other levels (individual, groups and organisations) were situated.

*Chapter eight* summarises and discusses the findings from each phase of the research. I discuss the themes that were introduced in the results chapters, and analyse my findings in relation to the research questions. I state my original contributions to knowledge to the field of EBM through a theoretical lens of knowledge mobilisation. I provide an in-depth overview of the strengths and limitations of my research and finally I offer my interpretations of the implications of the findings for policy, practice and research.

*Chapter nine* is the conclusion, and demonstrates how the research questions have been answered.

An overview of the chapter structure is provided in Figure 1.





**Figure 1. Overview of thesis structure**

## **1.5 Chapter Summary**

In this chapter, I have introduced this research and presented the main concepts and issues behind the study rationale. I have described the overarching structure of my thesis. In the next chapter I begin my literature review.

## **2 Literature Review: Knowledge, knowing and theoretical perspectives of knowledge mobilisation**

### **2.1 Introduction**

I use the viewpoint of knowledge mobilisation to investigate how factors across the knowledge domain interact to produce a system where variation in use and uptake of guidelines exists despite the continued efforts from policy-makers to instil their use in practice. I sought to identify what constitutes evidence and knowledge for orthopaedic clinical decision-makers and how that evidence and knowledge can be mobilised. The purpose of this chapter is to provide an overview of the concepts of knowledge and knowledge mobilisation and the implications of understanding of these concepts for healthcare delivery and practice. This chapter introduces three theoretical perspectives to explain knowledge mobilisation.

### **2.2 Definitions of knowledge and knowing**

The challenge of defining knowledge has given rise to a field of philosophy called epistemology, which investigates the theory of knowledge. It demonstrates that the study of knowledge is subjective, context-dependent and changeable (Hislop, 2013; Ferlie et al, 2012; Crilly et al, 2013). The Oxford English Dictionary (2015) defines knowledge as:

*"The fact or condition of knowing something: the fact of knowing or being acquired with a thing or person etc., and familiarity gained by experiences" (OED, 2015)*

This definition implies that there are several different types of knowledge and that these depend on our experiences. In the western philosophical tradition, knowledge is described as a justified true belief i.e., a person who holds knowledge believes that it is true (Roberts, 2015). However, what constitutes a 'justified true belief' is open to interpretation and depends on what we accept as empirical evidence and knowledge. These variable understandings mean that interpretations can change over time and in different contexts (Oborn et al,

2010; Crilly et al, 2013; Ferlie et al, 2015; Kislov et al, 2014; Davies et al, 2015), and knowledge may be viewed as socially constructed and variable between different individuals, organisations and contexts.

Policy-makers promote clinical guidelines, but if knowledge is a fundamentally socially created and dynamic construct, then guidelines may not be appropriate in all situations. One of the dominant themes in the literature concerns the debate about 'what is knowledge?' (Crilly et al, 2013). The terminology is not concrete and the words 'research', 'evidence' and 'knowledge' are used often interchangeably in healthcare. More commonly, the terms are viewed as existing in a hierarchical relationship where research is a type of evidence and evidence is a source of knowledge (Nutley et al, 2007).

What is considered knowledge is highly contested and influenced by the environment in which it is used (Swan et al, 2016). For example, power relationships can impact upon our access to knowledge and the legitimacy over knowledge claims (Crilly et al, 2013). This implies that a rational definition and interpretation of knowledge may be inadequate and is too simplistic for my research on the complexities of knowledge and evidence used in practice. More explanation and understanding is required to demonstrate how knowledge exists in various forms and changes over time and between contexts.

## **2.3 The characteristics of knowledge and knowing**

### **2.3.1 What is meant by knowledge?**

There has been a preference to assume a hierarchy of knowledge in the academic literature (Rowley, 2007), in which data sits at the lowest position and requires minimal human judgement, information sits in the middle, and knowledge and wisdom at the highest points requiring maximal judgement and interpretation (Tsoukas and Vladimirou, 2001; Rowley, 2007). Cook and Brown (1999) proposed a taxonomy of four distinct types of knowledge (individual, group, tacit and explicit) each equal to the other three, and performing a role that the others

cannot. The difference between tacit and explicit knowledge has been discussed to a great extent in the literature (Polanyi, 2012; Nonaka, 1994).

### ***2.3.1.1 Explicit-Tacit knowledge***

The distinction between the knowledge types, such as tacit and explicit, became a major theme in the knowledge mobilisation literature (Nonaka, 1994). The term tacit knowledge was first introduced by Polanyi in 1958 who presented the idea that 'we know more than we can tell' (Polanyi, 2012). Tacit knowledge can be described as informal, as knowledge that people just know and can often find difficult to describe easily. For example a surgeon might be able to recognise their patient in a waiting room, but would struggle to be able to explain in words how they recognise their face. According to Lam (2000) they are not conscious of their knowledge of the individual features of a patient's face, but rather they recognise it as a whole, as someone who is familiar to them. Explicit knowledge on the other hand is formal and codifiable, it can easily be explained and possibly understood by another person (Hislop, 2013).

Explicit-tacit knowledge types are linked. When an individual possesses knowledge, it is not 'in' the activity they are performing but in the knowledge they use in doing the activity. For example, a surgeon still possesses the tacit knowledge of how to perform an operation, even when they are not physically doing the activity in the hospital theatre. Similarly, a trainee surgeon may have the explicit knowledge to perform the operation, obtained from studying textbooks. However, they do not necessarily have the tacit knowledge needed to undertake the activity in the real world. In order to acquire tacit knowledge, the trainee needs to spend a certain amount of time actually doing the operation, gaining procedural knowledge and learning all the complexities involved, and complications which might be faced.

It is generally easier to share - or convey - formal, explicit knowledge over informal tacit knowledge. This is because the meaning of tacit knowledge may not be fully explicable or understood by others, which makes acting on the knowledge difficult (Russell et al, 2004). However, the distinction between tacit and explicit knowledge cannot explain all the necessary epistemic work that

individuals undertake. The relationship between group and individual knowledge is also important.

### ***2.3.1.2 Individual-Group knowledge***

There has been a tendency to privilege individual over group knowledge, on the premise that all learning takes place inside the heads of individuals. Hence, group knowledge is considered as fundamentally made up of lots of individuals who possess their own knowledge. This focus on the individual has changed in recent years with the growing literature which treats groups and organisations as objects in their own right (Davies et al, 2015). Organisations are able to possess knowledge which is distinct from that of its individual members (Brown and Duguid, 1991; Lave and Wenger, 1991).

This literature investigates how individuals function as a group by performing actions that are characteristic of that group's knowledge. The group (not the individuals) is taken as the primary unit of analysis and can be examined (Brown and Duguid, 1991; Lave and Wenger, 1991; Wenger, 1998). According to Cook and Brown (1999), individuals and groups each do epistemic work that the other cannot, for example, a consultant can know how to diagnose a patient based on their symptoms, but only the wider group of surgeons working in England hold the collective knowledge of all acceptable surgical practice in England. The group body of knowledge is held in common by the individual members of the group, each one possessing bits of knowledge in their area of expertise (Blackmore, 2010). It is not possible for individual members to possess all the knowledge of their group. Instead members draw on the body of knowledge to perform actions, in the same way the group draws on the knowledge to perform group actions (Lave and Wenger, 1991). This demonstrates that work done by a group, informed by the body of knowledge it possesses, is epistemically distinct from work performed by individuals (Cook and Brown, 1999).

### **2.3.2 Knowing as distinct knowledge**

Orlikowski (2002) emphasises the role of the person in the activity to distinguish between knowing (action, doing and practice) and knowledge (facts and processes). She suggested that embedded capabilities were important, where

knowing and doing are inextricably linked. By making this distinction, the human agency is acknowledged as an important factor. According to Tsoukas and Vladimirou (2001), individuals do not understand codified explicit knowledge until they are able to test it against their personal experience. People, therefore 'know' by relating explicit knowledge to their particular circumstance and the contingencies they face.

The act of knowing signifies an action or a practice because it is something that people do, not something they possess (Tsoukas and Vladimirou, 2001). If I want to examine what a clinician knows, I will have to understand both what they can do as well as what knowledge they possess (Cook and Brown, 1999). Practice in this sense means the real world work of individuals and groups that is informed by their environment, training or organisational and group context. This more inclusive concept is useful in my study of healthcare as it includes not only the knowledge of surgery for example, but the daily practice that has evolved and is contributed to by the individuals working in the field. This distinguishes knowledge in action and practice as 'knowing', compared to knowledge in possession, which is 'knowledge'. Both are important to study for people and organisations

For my research, knowledge is considered as the knowledge that an individual possesses, that is used in practice to address a particular problem, for example deciding on a treatment plan for a patient. Knowing requires an activity and context and makes use of knowledge in a productive and skilful way, for example, it is knowing that enables a treatment plan to be amended, for instance due to lack of resource in a hip preservation clinic. The action of doing exemplifies a form of knowing which could potentially lead to the production of new knowledge, such as developing a new treatment protocol for community care services outside the hospital.

## **2.4 Theoretical perspectives of knowledge mobilisation**

The use or non-use of evidence in clinical decision-making is a knowledge problem or a problem related to knowledge mobilisation (Crilly et al, 2010; 2013; Ferlie et al, 2012; 2015). Variation in the uptake of clinical guidelines in practice is potentially a problem of knowledge acquisition, mobilisation and transfer. Variation could also be associated with the way knowledge is privileged and adopted by individuals and groups within the organisation.

The focus of literature has moved away from traditional approaches which emphasised linear, rational, instrumental evidence transfer towards the broader field of knowledge mobilisation (Davies et al, 2015). This perspective acknowledges reported challenges, and incorporates the social and relational processes in healthcare, rather than excluding them (Kislov et al, 2014; Oborn et al, 2010). Many theoretical frameworks have been developed which aim to explain knowledge mobilisation issues. Those most applicable for my research are those that evolved from the organisational sciences field as applied to healthcare. Unlike traditional clinical science models of EBM, theories from organisational sciences take the context of practice into account. Using this approach acknowledges that clinical guidelines are only one source of many types of knowledge that interact in the social world of healthcare.

The key theoretical frameworks relating to knowledge mobilisation are, clinical mindlines (Gabbay and Le May, 2004), Communities of Practice (CoP) (Lave and Wenger, 1991), organisational and knowledge boundaries (Carlile 2002, 2004) and capabilities of healthcare organisations to absorb and use knowledge in practice, known as Absorptive Capacity (ACAP) (Cohen and Levinthal ,1989; 1990).

### **2.4.1 Replacing guidelines with clinical mindlines**

A significant development in this field was the introduction of the concept of clinical mindlines. Unlike guidelines, mindlines can be used to reflect the amalgamation of knowledge, experience and evidence that exist in real world decision-making (Gabbay and Le May, 2004). The authors defined mindlines as:

*"The internalised, collectively reinforced tacit guidelines that are informed by clinicians training, own and each others experience, interactions with role sets, reading, how they have learnt to handle conflicting demands and by their understanding of local circumstance and systems" (Gabbay and Le May, 2004)*

Mindlines are an all-encompassing concept and have been the focus of much research in the past decade (Wieringa and Greenhalgh, 2015). They demonstrate a more flexible, complex, and adaptable approach to evidence and knowledge compared to clinical guidelines. They incorporate clinicians' multiple roles, values, past training and experience (Gabbay and Le May, 2011). According to Gabbay and Le May (2011) mindlines develop in medical training but are continuously developed, amended, refined and reinforced through a clinician's career in conjunction with their experience and contact with others. This flexibility allows the collective experience of a group to be considered as an additional source of evidence to influence decisions. The same could be suggested for the influence of the wider organisational, political and contextual factors. These are the issues that critics of EBM reported were missing in the traditional approach (Dopson and Fitzgerald, 2005; Timmermans and Berg, 2010; Greenhalgh et al, 2014).

Since mindlines can include multiple sources of evidence, they reportedly give clinicians the capability to make decisions that consider more than just technical and clinical elements (Gabbay and Le May, 2011). Clinicians become more flexible to change, and generate new knowledge and continue to improve their performance by reflecting on their decisions and outcomes (Gabbay and Le May, 2011). This reinforced and embedded knowledge therefore allows clinicians to function by giving them a sense of who they are, what they need to do and how all the potential sources of evidence fit into their practice (Wieringa and Greenhalgh, 2015). The mindline approach is interesting. However, mindlines are challenging to identify, as they are not concrete objects and cannot be easily traced and understood.

Clinicians are reported to develop collective mindlines, which are shared across their professional networks and groups. The collective mindline establishes boundaries around what is valued and considered evidence and knowledge



within the group (Gabbay and Le May, 2011). So not only is it challenging to identify an individual mindline, it may be problematic to reveal how collective mindlines, like the legitimate knowledge present in Communities of Practice, influence clinical practice within orthopaedic surgery.

The key point here is that clinicians supposedly default to mindlines when making decisions or when their practice is challenged. However, it does not predict that mindlines are fixed. According to Gabbay and Le May (2011) new knowledge created through mindlines does not replace the knowledge that went before. Instead it becomes integrated. However, the stickiness of this experiential knowledge means that 'bad' ideas can also spread between individuals and groups working in healthcare. Unlike guidelines, mindlines are not right or wrong, good or bad, they develop as required.

Mindlines are created as part of a continual social process of negotiation between clinicians (Gabbay and Le May, 2011). This process may result in multiple sources of evidence and knowledge linked to the contingent requirements of the environment. What is important to consider in decision-making for one surgeon at one point in time may not be relevant later. The negotiation process can transform explicit knowledge from research evidence into knowledge that is internalised in mindlines so that they are useful in practice (May et al, 2006). Over time, surgeons could favour or privilege these different sources of evidence over others available to them. In this sense, they create their own hierarchy of evidence which incorporates their mindlines. This hierarchy could help broker the sources of evidence important during decision-making. However, this knowledge mobilisation process is unpredictable, sometimes unplanned and lacks transparency.

#### **2.4.2 Legitimate Peripheral Participation and Communities of Practice**

The principal assumption of this theory is that people learn through a process of participation in group situations. This takes precedence over the one-way flow of information from clinical guidelines. Although this theory was not developed in the context of healthcare, it is highly applicable to my research. Lave and

Wenger's (1991) instrumental book entitled 'Situated learning: legitimate peripheral participation' depict how individuals learn new knowledge.

They suggest that in order to absorb and mobilise knowledge, the person who is acquiring knowledge needs to do more than observe a group in action. The aim of knowledge mobilisation in Communities of Practice (CoP) is via active participation. Individuals learn by absorbing and being absorbed into the context and culture of a group. Over time, these contexts and cultures become embedded, and the individual can intuitively understand what it is to be part of the community (Lave and Wenger, 1991). This type of learning occurs beyond the context of the individual at one point in time, as it takes into account wider cultural practices and the norms of the group. Therefore, it is said to alter the identity and skills of individuals (Lave and Wenger, 1991).

Legitimate Peripheral Participation (LPP) is a method of active learning in context and is important in the hospital setting, as clinicians in communities exist in a constantly changing environment where NHS hospital staff, infrastructure, resources and systems are unstable (Walshe and Davies, 2013). Therefore, knowledge of what it is to be a clinician is constantly changing, gets renegotiated and is updated in an endless cycle with the social environment (Timmermans and Kolker, 2004). The negotiation and renegotiation of the meaning of knowledge and evidence is important as it suggests that experience and behaviour constantly interact with meaning. Knowledge that develops has a particular meaning for the individual, but is also reproduced in the wider community. In this sense, Lave and Wenger (1991) suggest that legitimate peripheral participation is:

*"both the development of knowledgeably skilled identities in practice and the reproduction and transformation of communities of practices" (Lave and Wenger, 1991).*

Learning and developing knowledge allow a person to become a member of the community, but when knowledge is owned by the community as a whole it can be sustained and reproduced in the environment. Group knowledge can be transferred from old to new members through learning (Lave and Wenger,

1991). The characteristics of the group reflect the social context in which the CoP is located (e.g., academic clinicians may be more likely to work in a University hospital and form a CoP around the use of clinical trials). Lave and Wenger (1991) referred to this continual process of knowledge mobilisation in context as a generative process of a CoP producing their own future.

I have highlighted that the shared understanding, norms and values of groups are important for obtaining membership of the community. This notion is transferable to healthcare settings where strong occupational groups exist and where clinicians develop natural epistemic communities around their clinical specialties and professional roles (Crilly et al, 2010; Kislov et al, 2011; Kirmayer, 2012). In my empirical work, examining knowledge use in practice will be important to reveal how CoP reinforce their knowledge and shape the behaviour and actions of their community members (Szulanski, 2000). This theory is important for my research as it acknowledges the importance of the interactions between the individual, the activity (the clinical decision) and knowledge and knowing in the social world.

### **2.4.3 Knowledge boundaries and boundary spanning**

Not all groups within organisations are CoP (Oborn and Dawson, 2010a). Some groups might work together because of an organisational or professional association; they represent a functional group (Oborn and Dawson, 2010b). Divides between these groups are often referred to as cross-community boundaries (Hislop, 2013). The collaboration and knowledge mobilisation that occurs between functional groups is known as boundary spanning (Carlile, 2004). It describes how individuals who sit on either side of a theoretical or practical boundary have divergent identities and knowledge that can be bridged by spanning the boundary.

#### ***2.4.3.1 Knowledge sharing between functional groups***

Carlile (2002) describes the divide between functional groups as a knowledge dimension and suggests that the characteristics of knowledge are important for knowledge mobilisation. In my study, functional groups could be managers and clinicians, or distinct groups of clinicians such as orthopaedic surgeons. They

could even extend to policy-makers and whole hospital organisations. Each one of these groups could have distinct interpretations of what knowledge is.

The identities that people have in the groups or contexts influence the dynamics and interpersonal relationships that develop. Consequently, these impact on the inter-personal knowledge processes (Carlile, 2002). The knowledge processes between different contexts and functional groups are likely to be more complex and challenging to manage compared to those that exist within a CoP. This is because identities, meanings and interpretations are not shared in the same way.

Nevertheless, collaboration between individuals and groups is required for organisations such as hospitals to function. We cannot expect entire organisations to develop as a CoP. To understand knowledge mobilisation in healthcare, it is important to understand how knowledge can be shared across boundaries and how the lack of common knowledge and shared identity shapes knowledge dynamics. The contextual nature of knowledge develops within distinct functions of an organisation because each function has a specific focus, distinctive problems and localised practices that become the norm (Carlile, 2002). This implies that what works for the surgeon may not necessarily work for a finance manager within the same organisation. Collaboration across the distinct functional boundaries, for example to purchase hip replacement prosthesis constitutes a boundary spanning process. The delivery of healthcare services involves multidisciplinary cross professional collaboration.

The knowledge base of an organisation can, be considered as made up of a variety of localised groups. The difference in the knowledge of these groups could lead to variation in the practice of group members. Groups can have some over-lapping knowledge, but there will be one who potentially possess more specialised and specific knowledge about a topic compared to another (Hislop, 2013). The idea that knowledge can be mobilised using a boundary spanning approach suggests that the fragmented knowledge of the distinct groups could be integrated, to achieve a specified goal.

#### **2.4.3.2 Knowledge processes across boundaries**

Members of CoP share a tacit understanding of knowledge processes which makes knowledge sharing easier (Van Den Hooff et al, 2003). When examining functional groups who work across boundaries, knowledge processes are not as straightforward. Individuals working in large hospitals might not necessarily have common knowledge, similar values and shared identity. This can lead to ineffective knowledge mobilisation, as the social relations between individuals who are not members of the same group are less conducive to effective knowledge sharing (Currie and White, 2012).

There are two key factors that make the process of cross-boundary knowledge sharing challenging for healthcare and particularly for orthopaedic surgery. These are the weak shared sense of identity between groups, and the difference in the accepted and privileged knowledge of each boundary group (Hislop, 2013). The epistemic differences between the groups in my research may also limit knowledge sharing that takes place, for example between managers, clinicians and administrative staff (Jacobson, 2007). This is because the different knowledge types are based on different assumptions, values and world views about what is true and correct (Jacobson, 2007).

#### **2.4.3.3 Different types of boundaries**

The different types of boundary which have to be crossed are also important for knowledge mobilisation and are worthy of investigation. Three distinct boundary categories have been described in the literature (Carlile, 2004).

*Syntactic* boundaries are presumed to be the easiest to cross because individuals share a common set of ideas and values (Carlile, 2004). This boundary describes knowledge sharing between two surgeons in the same specialty who mobilise knowledge and information together with ease. The second type of boundary is called a *semantic* boundary. Knowledge sharing here is slightly more challenging. People on either side of this boundary do not share the same identity or values of practice, and this leads to differences in interpretation and understanding of the same information (Carlile, 2004), e.g., the knowledge contained in a clinical guideline. The most complex boundary is the *pragmatic*

boundary (Carlile, 2004). This type of boundary is problematic because individuals have significantly different views and beliefs about knowledge, and also contrasting interpretations of the politics of practice and of how work should be conducted (Currie et al, 2007). Knowledge mobilisation across pragmatic boundaries is not easy to achieve, as both sides are invested in their way of thinking and behaving, and knowledge sharing is restricted (Kimble et al, 2010).

A key factor in all three boundaries described by Carlile (2004) is the ability to work across the boundary through the introduction of a common ground. This could be an object, a specific knowledge artefact or a knowledge broker, e.g., an individual with knowledge and identify across both sides of the boundary. These knowledge objects or brokers can act as a vehicle to help smooth the crossing of boundaries because groups perceive themselves to be equal from both sides (Star and Griesemer, 1989). In this sense, boundaries do not always have to engender the identity and epistemic challenges described earlier, if groups can develop a shared understanding or aim. However, in practice it might be difficult to achieve when common knowledge is absent, for example when evidence-based knowledge is in direct competition with the practice-based knowledge of clinicians.

Knowledge mobilisation is nevertheless necessary for healthcare and is fundamental for the effective use of clinical guidelines in practice. Hence, focusing on understanding and improving the interaction and communication that takes place across knowledge boundaries will be important for my research. Effective knowledge mobilisation implies those involved in healthcare appreciate and are accepting of the differences in perspectives and knowledge which exist in the real world NHS.

#### **2.4.4 Absorptive capacity and the capabilities of healthcare organisations to mobilise knowledge**

The theory of Absorptive Capacity (ACAP) is recommended as a way of encouraging knowledge mobilisation in organisations. It focuses on the ability of

an organisation to identify, assimilate, value, transform and exploit new knowledge from its environment (Easterby-Smith et al, 2008, Oborn et al, 2013a). ACAP can be applied to various units of analysis, including groups of surgeons, departments, or the entire hospital organisation.

ACAP originated from the study of innovation and learning within organisations (Cohen and Levinthal, 1989). The theory implies that organisations should strive to increase their ACAP because they will be in a better position to obtain and understand external sources of evidence and knowledge to support their work (Cohen and Levinthal, 1989).

ACAP predicts that the cost of obtaining external knowledge is small when the organisation has invested resources (such as time and money in staff training) to develop its skill in identifying, assimilating and exploiting knowledge from the environment (Cohen and Levinthal, 1989).

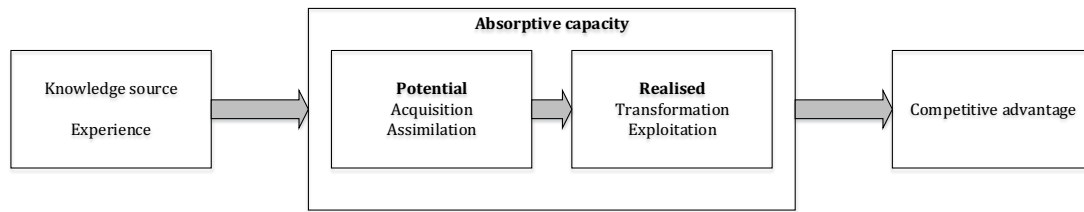
ACAP may be particularly salient for healthcare. However, Easterby-Smith and colleagues (2008) argue that the literature has failed to develop insights into the processes of ACAP. They suggest that a process perspective on ACAP should include the role of power in how knowledge is absorbed by organisations, and should provide better understanding of the nature of boundaries within and around organisations (Easterby-Smith et al, 2008).

#### ***2.4.4.1 The ACAP framework***

A framework to represent the theory of understanding ACAP was developed by Zahra and George (2002) (see Figure 2). This framework presents four components of ACAP that are important for knowledge mobilisation. This warrants its inclusion in my study. These distinctive components can help to explain the variation found in knowledge mobilisation in healthcare. The components are:

- Identifying and accessing relevant knowledge in the environment
- Analysing and interpreting new knowledge through assimilation
- Integrating new knowledge with existing knowledge

- Transforming the knowledge within the organisation (Zahra and George, 2002).



**Figure 2. A framework to represent the theory of ACAP (adapted from Zahra and George, 2002)**

Zahra and George (2002) proposed two further types of ACAP. Potential Absorptive Capacity (PACAP) which represents an organisation's ability to acquire and assimilate knowledge, and Realised Absorptive Capacity (RACAP), which represents the organisation's skill at putting new knowledge into practice through the process of transformation and exploitation. The overarching aim of the organisation is to close the gap between potential and realised ACAP. In order to achieve this, a hospital or department has to understand their organisational capabilities (Volberda et al, 2010). These are the factors that allow knowledge to be assimilated, understood and used in healthcare practice.

#### **2.4.4.2 Organisational capabilities**

Organisational capabilities describe the capabilities or tools that an organisation such as a hospital requires to enable it to obtain and exploit knowledge from its environment (Volderba et al, 2010). Capabilities allow new sources of knowledge to be identified, incorporated and used within the organisation. Volderba and colleagues (2010) described three tools which could be used to improve organisational capabilities. These are co-ordination, systems and socialisation capabilities (Volderba et al, 2010). *Co-ordination capabilities* are the skills owned by staff members who work in the organisation. In my study, this may be the communication skills or the education and training of clinicians and staff. The use of boundary spanners, and networked CoP may also increase co-ordination capability by increasing the use of decentralised authority (Waring et al, 2014).



*Systems capabilities*, on the other hand, represent formal knowledge of an organisation and can include policies, procedures and clinical pathways aimed at transferring codified knowledge across the organisation (Volderba et al, 2010). Systems capabilities can, however, limit the discovery of new knowledge because staff become fixated on maintaining procedures and regulating the behaviour of individuals, rather than searching for new information elsewhere (Waring et al, 2014). Therefore, the way in which the knowledge is created and shared within the organisation may influence whether it is used or not.

Finally, *socialisation capabilities* reflect the cultural factors within the organisation which influence knowledge sharing. They represent the shared norms and understandings of people working in an organisation (Volderba et al, 2010). As expected, staff with similar norms and understanding are better able to transform and exploit new knowledge as they have the same frame of reference. However, as mentioned previously, norms can also limit knowledge mobilisation when they restrict knowledge assimilation because it does not fit with what is expected (Volderba et al, 2010).

According to Cohen and Levinthal (1990) it is easier to absorb external knowledge when it is linked to knowledge that already exists in the organisation. To improve this process an organisation needs to be able to appreciate and understand the potential value of the new external knowledge for their current situation, e.g., why would the NICE guidance help them in their practice? It will be important to examine and understand the system and wider organisational cultures of the hospitals in the empirical setting to examine the organisational knowledge and how it is used.

To improve knowledge sharing within hospitals, it is necessary to recognise the different processes (i.e., capabilities) underlying internal and external drivers of knowledge and the interactions between them. In a similar way to the concept of clinical mindlines, ACAP is not an object that can be explicitly examined in isolation. The context of study is important and this needs to be measured and captured. The external environment may also determine incentives for

improving ACAP, for example, local competition between hospitals and new regulations may restrict or facilitate ACAP activities. The internal environment is similarly important as it will potentially influence the efficiency and effectiveness of organisational ACAP, but it may also constrain what knowledge can be integrated and used. In order to focus on knowledge mobilisation, organisations might need to move away from rigid structures towards a more flexible approach. A focus on ACAP could influence the strategies that hospital managers tend to adopt to change the existing structures and processes towards learning and innovation.

## **2.5 Chapter summary**

The epistemological debates surrounding knowledge and knowing may, at first glance, seem inappropriate for the study of how surgeons working in the NHS make decisions for patients. However, it is essential for me to ground the research in the theoretical understanding of what knowledge is and how it is mobilised. The use of evidence in clinical decision-making for orthopaedic surgery is a knowledge problem, as variation has been found in the process of knowledge acquisition, the way evidence and knowledge are mobilised in hospitals and the knowledge brokering that occurs in individual surgeons' heads (Grove et al, 2016). Each of these may be important for understanding variation in practice.

An outcome could be a clinical decision or new innovations, new knowledge or new products or new ways of using knowledge which neither tacit nor explicit knowledge could have produced in isolation. It is the *context* of clinical practice, the interaction with the social and physical environment, which is important for my research, as clinical decisions are made in complex social and physical environments. This leads to questions about how organisations such as hospitals can encourage the sharing of knowledge, including evidence-based guidelines, across individuals and groups. It will also be important during my empirical work to try to understand how to create the social or contextual situations which can support surgeons, working in hospitals, to develop new ways of knowing and new ways of practising that are inclusive of EBM.

The theoretical perspectives introduced in this chapter have been developed to explain and improve knowledge mobilisation between individuals and groups and in organisations. The aim of including these theories was to provide a context and background from which to develop my empirical research. I described clinical mindlines, Communities of Practice, organisational knowledge, boundary spanning and Absorptive Capacity.

The theories of knowledge mobilisation are clearly useful and applicable to my study, specifically because they take account of context, rather than excluding context. They help us to understand how healthcare organisations can encourage the sharing of knowledge among individuals and groups. Theories facilitate ideas about the creation of social or contextual situations which support people and organisations to develop new ways of knowing and new ways of practising knowledge mobilisation in healthcare.

The next chapter introduces the research questions and research methods for my empirical work.

## 3 Research Methods

### 3.1 Introduction

In this chapter I present my research questions and objectives. I begin by outlining the study setting and my epistemological approach. I describe my research methods and the methodological approaches taken to achieve each research objective. I provide a detailed account of the stages of the case study method. I end the chapter by outlining the data collected and the analysis techniques I used.

#### 3.1.1 Research questions, objectives and study outline

This study has three research questions, and three research objectives which were developed to answer the questions. They are displayed in Table 1.

**Table 1. Research questions and research objectives**

Research questions	
<b>RQ1</b>	What types of evidence and knowledge are considered important by orthopaedic surgeons when making clinical practice decisions?
<b>RQ2</b>	How are evidence and knowledge mobilised in the real-world practice of orthopaedic surgery in the NHS?
<b>RQ3</b>	What are the key dimensions of knowledge mobilisation which influence variation in decision-making in the orthopaedic surgery NHS environment?
Research objectives	
<b>1</b>	To undertake observations and interviews with orthopaedic surgeons and associated staff working in the NHS in England, and analysis of associated documentation, to identify what types and evidence and knowledge are considered important for decision-making.
<b>2</b>	To integrate the findings from three case studies of clinical practice to develop a framework to understand knowledge mobilisation in the context of UK orthopaedic surgery decision-making.
<b>3</b>	To generate themes which summarise where, when and how evidence and knowledge are used in decision-making, and to describe where the mobilisation of knowledge has the greatest influence on variation in practice.

### 3.2 Study methodology

In order to conduct the empirical work, it was important to consider three elements of the research methodology. These are the philosophical assumptions

about what constitutes knowledge claims, the strategies of inquiry (e.g., qualitative, quantitative and mixed methods) and the detailed procedures of the research (Crotty, 1998; Creswell, 2009).

### **3.2.1 Philosophical assumptions**

A knowledge claim implies that the individual conducting research holds certain assumptions about how knowledge is developed and what will be learnt during the process. These philosophical assumptions are referred to as epistemologies and ontologies (Crotty, 1998). Ontology is a claim about a worldview, i.e., what knowledge is, whereas epistemology describes how we know what we know. It is made up of our values or axiologies (Creswell, 2009). My research takes a pragmatic stance as it uses methods deemed appropriate for understanding the real world variation in the mobilisation of knowledge and evidence used in decision-making in orthopaedic surgery.

At the beginning of the work I did not set out to conduct the research through a particular theoretical lens. Nevertheless, it is important to recognise that my research questions and objectives align to a constructivist understanding as I seek to explore the meanings that groups of NHS staff hold towards different forms of evidence and knowledge in practice. The traditional constructivist approaches in qualitative research assume that truths are socially constructed and do not exist separately from the subjective interpretation of a person (Sale et al, 2002).

By taking a pragmatic approach to the work, I anticipated that the most appropriate theories would be induced from the data. At the same time, they would be deduced from previous literature and existing theories described in the literature reviews. Consequently, my pragmatic research approach is abductive in nature (Mantere and Ketokivi, 2013). The structuring of my data and findings will be influenced by existing literature and theories of knowledge mobilisation described in the literature review (Chapter 2). I take both objectivist and interpretivist assumptions at face value (Pratt, 2009). This enabled me to combine the multiple representations experienced by staff at each of the Trusts.

I was able to group these with my own perspectives and understanding of the context. This idea of multiple representations and experiences is important in the pragmatic approach and it emphasises the key role of context in my study, for example, how context interacts with knowledge mobilisation in practice. Ultimately this approach helped me to understand real-world phenomena as they unfolded throughout the research (Johnson and Onwuegbuzie, 2004).

### **3.2.2 Strategies of enquiry and research design**

Mixed methods approaches are becoming increasingly popular to investigate complex phenomena (Creswell, 2009). In this research, I used a mixed qualitative design. I chose to combine and interpret the findings of different methods together throughout the case studies. All strategies of enquiry have limitations. Using mixed methods helped to reduce the biases of a single method by overcoming the weaknesses inherent in any one particular qualitative method. Together the mixed methods approach helped to expand my understanding from one method to another, for example allowing sense checking of data from observations during the interviews, and in combining or corroborating findings from different data sources across cases (Jick, 1979).

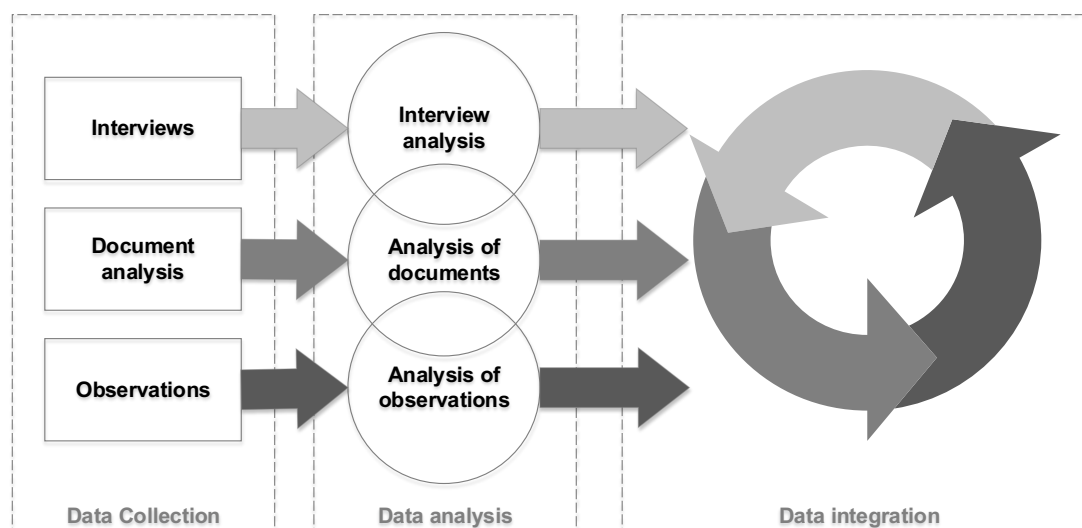
I chose qualitative methods for the empirical work because they allowed me to account for the subjective attitudes and beliefs of staff, and to explore the context of organisational norms that influence the delivery of orthopaedics services. I considered my research findings in the context of each of the individual services to contextualise them in terms of the knowledge, theory and practice that were elucidated through my literature review.

Three procedures for mixing methods have been developed, these are termed sequential, concurrent and transformative study designs (Creswell, 2009; Tashakkori and Teddlie, 2003). Each design differs in the priority it gives to the data type, the sequence of data collection and the time at which the data integration occurs, they are described in Table 2.

**Table 2. Four general strategies for mixed methods research (Creswell 2009)**

Strategy	Approach	Description
Sequential	Explanatory	The collection and analysis of quantitative data followed by qualitative data. Priority is given to quantitative data and qualitative data is used to explain and interpret the quantitative findings. Integration occurs during interpretation of results
	Exploratory	The collection and analysis of qualitative data followed by quantitative data. Priority is given to qualitative data to explore a phenomenon or test a theory. Integration occurs during interpretation of results
Concurrent	Triangulation	Methods are selected to cross-validate or corroborate findings within a study to overcome the weaknesses within one method. Equal priority is given to the methods and the integration occurs during the interpretation phase. This helps to explain convergence of the findings to strengthen knowledge claims, or helps explain why there is lack of convergence
	Nested	Both types of data are collected simultaneously, but one method is selected as predominant and guides the study. The method with less priority is nested within the research. The data are mixed during analysis. The aim is to give a broader perspective as a result of using different methods
Transformative	Sequential	Either data collection method can be used first, but one occurs prior to the other. Generally a theoretical perspective guides the study and helps to better understand a phenomenon. Integration occurs during interpretation of results
	Concurrent	The types of data are collected at the same time during one data collection phase and may have equal or unequal priority. The integration of the data occurs during the analysis phase

I selected a concurrent triangulation strategy as all the data were collected simultaneously within each case. Even though the cases were entirely qualitative, the approach to mixing qualitative methods aligns to the general strategy outlined by Creswell (2009) and provided a helpful framework to follow. This design combines three types of qualitative data and each type was treated equally in the analysis where appropriate. A diagrammatic representation of the study design is presented in Figure 3.



**Figure 3. Diagrammatic representation of the study design used during primary data collection**

In this design, the data is integrated during the interpretation phase of the research. The process of integration and interpretation helps to explain the convergence of the findings within and across the cases, therefore strengthening the knowledge claims. It can also help to explain why a lack convergence or deviant instances might occur across findings. The purpose of mixing the qualitative methods was to measure the overlapping but also different aspects of decision-making within orthopaedic surgery. According to Greene and colleagues (1989), this process helps to ensure an enriched and elaborated understanding of the phenomenon.

In this section I have outlined my epistemological approach and have described the rationale, structure and design of the research. The next section will provide a more detailed description of the study and the methodological approaches taken to achieve each research objective.

### **3.3 Individual research components**

This section presents a detailed description of the research methods. Each research component will be described below including the analysis techniques used.



#### ***3.3.1.1 Study setting***

This study was conducted in three National Health Service (NHS) hospital Trusts across England, one in the North, one the Midlands and one in the South West.

The core study was confined to public sector services although some private sector and third party organisations were included as key stakeholder organisations due to their interaction with the NHS. See Box 1 for supplementary information regarding the NHS context during the study.

### Box 1. NHS context during the period of study

#### NHS context

The NHS is financed mainly by general taxation, and is free to users at the point of delivery. NHS services are managed separately in England, Scotland, Wales and Northern Ireland. In England, commissioners pay healthcare providers for each patient seen or treated, taking into account the complexity of the patient's healthcare needs, using a system known as "Payment by Results" (PbR). This set national tariffs for episodes of care (DH, 2012).

Tariff prices have traditionally been based on the average cost of services reported by NHS providers. The introduction of "best practice tariffs" (BPT) in 2010-11 aimed to ensure that tariffs are determined by best clinical practice rather than average cost. The first BPTs were released in 2010-11 for high volume service areas characterised by significant unexplained variation in practice and clear consensus of what constitutes clinical best practice. These included fragility hip fracture, so an additional payment is payable where care complies with clinical characteristics of best practice (DH, 2012). The BPT was mandatory from 1 April 2010 and applies to patients admitted from this date (NHFD, 2012).

The National Joint Registry (NJR) was set up by the Department of Health and Welsh Assembly Government for the mandatory collection of information on all hip replacement operations from NHS organisations and private practice, and to monitor the performance of joint replacement prostheses. Since 2009, all NHS patients who are having hip replacement surgery are invited to fill in Patient Reported Outcome Measures (PROMs) questionnaires about their health and quality of life before and after their surgery (NICE TA304, 2014).

In 2014/15, a new BPT for primary hip replacements was introduced, linked to data collected in both PROMs and the minimum threshold for submission of data to the NJR (NJR, 2017).

The criteria for payment of the BPT are:

- a. the provider not having an average health gain significantly below the national average
- b. the provider adhering to the following data submission standards:
  - i. a minimum PROMS participation rate of 50%
  - ii. a minimum NJR compliance rate of 75%
  - iii. an NJR unknown consent rate below 25% (i.e. there should be <25% of cases where patient consent was not recorded as a 'yes' or 'no') (NHS England, 2017)

#### **3.3.1.2 Reflexivity**

Throughout the study I was conscious of my role as a researcher and my outsider status within each Trust. Despite my independent position, I am employed by a Higher Education Institution, funded by the National Institute for Health Research (NIHR) in the UK and aligned to the professional conduct of the British Psychological Society. I have a background and training in psychology as applied to health, and have conducted Health Services Research for approximately 10 years. During this time, my research interests have transitioned away from the psychology of the individual, towards the sociological aspects of healthcare and organisational sciences. Prior to commencing my PhD, I was employed in a Technology Appraisal Review team who conduct clinical effectiveness and cost

effectiveness reviews of health technologies for NICE and other policy makers. It is important to state that RCTs and EBM are the privileged sources of evidence in this research environment. I was part of the research team who updated the NICE guidance for hip replacement in 2014 (see Introduction 'Context and Rationale'). I have no additional conflicts of interest to declare.

Due to the nature of my research methods, my role in data collection and analysis will have been shaped by the approaches, decisions and choices I made as the study progressed. In qualitative research, we have an understanding that bias will happen. The aim of the researcher is to understand how you can reduce the impact that bias has to make your findings trustworthy, credible and neutral. Despite having planned a research protocol prior to conducting the study, I chose to maintain flexibility to allow for progressive focusing. Therefore, I was able to follow lines of insight and potential avenues of interest as the study progressed. To account for the range of biases that I, and my selected Trusts, might have encountered on this journey, I maintained a research journal. I made notes of my interactions and thoughts after each significant point of data collection and considered how my role as an outsider (and sometimes an insider) was reflected in the data that I obtained. I have not formally included this reflection in this thesis but it helped to frame my thoughts and served as a reminder during the data analysis.

### **3.3.2 Methods**

The mixed methods for each case included interviews, observations and document analysis. These methods enabled me to observe the social, cultural and knowledge context of evidence use in the three NHS hospitals first-hand. Given the variation present across orthopaedic centres and between individual surgeons (NJR, 2012) and their networks, I aimed to focus on perceptions, attitudes and behaviours of orthopaedic surgeons and staff practising within the three hospitals. To achieve maximal sampling variation, I selected hospitals which had contrasting local populations, service provision, professional composition, research capacity and management structures.

### **3.3.2.1 Case study research**

Case study research focuses on understanding the dynamics present in single settings. These settings can have multiple cases or multiple levels of analysis (Yin, 1984). In my research, the setting was the hospital Trust and multiple cases were planned. Case studies typically combine a variety of data collection techniques in order to provide descriptions and to test and generate theory about the topic.

There is confusion and lack of clarity around the processes for qualitative data collection, and theory building from case study research. Previous methods have emphasised continuous comparison, which stresses the emergence of categories from the evidence (Glaser and Strauss, 1967), typologies of case study design focused on replication logic and validity (Yin, 1984) and techniques for improving analysis without removing the meaning of the data (Miles and Huberman, 1984). In an attempt to overcome this lack of clarity, Eisenhardt (1989) provided a roadmap for conducting case study research. I selected this transparent and structured approach to my research.

The roadmap method is beneficial in that it is broken down into eight steps which can be followed systematically. These steps are presented in Table 3.

**Table 3. The process steps of building theory from case study research (Eisenhardt, 1989)**

<b>Step number</b>	<b>Activity</b>	<b>Reason</b>
1. Getting started	-Definition of research question -Possibly a priori constructs	-Focuses efforts -Provides better grounding of construct measures -Retains theoretical flexibility
2. Selecting cases	-Neither theory nor hypothesis -Specified population -Theoretical, not random sampling	-Constrains extraneous variation and sharpens external validity -Focuses efforts on theoretically useful cases - i.e., those that replicate or extend theory by filling conceptual categories
3. Crafting instruments and protocols	-Multiple data collection methods -Qualitative and quantitative data combined -Multiple investigators	-Strengthens grounding of theory by triangulation of evidence -Synergistic view of evidence

		-Fosters divergent perspectives and strengthens grounding
4. Entering the field	-Overlap data collection and analysis, including field notes -Flexible and opportunistic data collection methods	-Speeds analysis and reveals helpful adjustments to data collection -Allows investigation to take advantage of emergent themes and unique case features
5. Analysing data	-Within-case analysis -Cross-case pattern search using divergent techniques	-Gains familiarity with data and preliminary theory generation -Forces investigators to look beyond initial impressions and see evidence through multiple lenses
6. Shaping hypothesis	-Iterative tabulation of evidence for each construct -Replication, not sampling, logic across cases -Search evidence for 'why' behind relationships	-Sharpens construct definition, validity, and measurability -Confirms, extends and sharpens theory
7. Enfolding literature	-Comparison with conflicting literature -Comparison with similar literature	-Builds internal validity, raises theoretical level and sharpens construct definitions -Sharpens generalisability, improves construct definition and raises theoretical level
8. Reaching closure	-Theoretical saturation when possible	-Ends process when marginal improvement becomes small

This method suggests that a piece of research is started as close as possible to the ideal of 'no theory under consideration'. Eisenhardt suggests that pre-selected theoretical perspectives may bias and limit research findings (Eisenhardt, 1989). A detailed account of how each step was completed in my research is presented in Table 4.

**Table 4. A detailed account of each roadmap stage**

Roadmap step	Detailed description
<b>1. Getting started</b>	An initial definition of the research question is important for case study research. This includes specification of the key concepts of the study as this enables more accurate measurement of them. According to Eisenhardt (1989), definition and specification of the research concepts allows for a stronger empirical grounding for any emergent theory that develops. The key concepts in my research are evidence and knowledge and how they influence decision-making in orthopaedic surgery.
<i>Concept definition:</i>	
<i>Evidence &amp; knowledge</i>	I described the challenges in defining evidence and knowledge in the literature review. These are contested concepts in both the literature and in practice (Gkeredakis et al, 2011; Swan et al, 2012). It was important to recognise and be reflective about the definition that the participants, and I as a researcher, made regarding these terms. The initial definitions were tentative and changed as the research progressed and data

<p><i>Decision-making</i></p> <p><i>Orthopaedic surgery</i></p>	<p>collection evolved. At the beginning of the research, my definition of evidence was grounded in the epistemological domain of clinical sciences, where evidence represents an empirical construct which could be tested using scientific methods to support or refute a hypothesis. This is the definition taken within traditional EBM where evidence is structured in a hierarchy (Sackett et al, 1996).</p> <p>As the research progressed my definition changed. The literature review informed my thinking and the definition evolved to be more inclusive of other types of evidence and knowledge which exist in the social and organisational science domains. The updated definition I use throughout the study is as follows: evidence is any construct presented that supports a statement, irrespective of whether the statement is true or false. This definition links back to the literature described in Chapter 2 where evidence and knowledge are closely tied to epistemology. The participants were able to provide various definitions of evidence. This supports the pragmatic approach selected.</p> <p>The definition of decision-making is generally more accepted in the literature but is still not concrete. Within this research, decision-making is defined as: the cognitive process which produces a selection of beliefs or courses of action among several alternative options, for example alternative treatments for patients (Schwartz and Bergus, 2008). Examining decision-making allowed me to investigate and identify these alternatives based on the values and preferences of the participants who made decisions. Where possible, I examined the processes of decision-making and the decision outcomes.</p> <p>Orthopaedic surgery was defined as a medical specialty which focuses on injuries and disease of the musculoskeletal system. Orthopaedic surgeons are the clinicians who deal with problems of this system, the bones, joints, muscles, tendons and ligaments (Lock et al, 2001). Within the NHS in England, orthopaedic surgeons are registered with the Royal College of Surgeons of England.</p>
<p><b>2. Selecting cases</b></p>	<p>The research population is important as it defines the set of entities from which the research sample is to be drawn (Eisenhart, 1989). The population for this research comprised NHS hospitals in England and Wales who reported data to the National Joint Registry in 2012 (225 hospital units representing a 94% participation rate in 2012 [225/240]) (NJR, 2013). Restricting the population in this way helped to define the limits for generalising the findings of my research. Once the population was defined, the cases sampled from the total population were selected.</p> <p>I chose three cases to provide a characteristic picture of diverse NHS hospitals providing hip replacement procedures. The cases were purposively sampled because they were geographically separate and show variation in proximity to, and association with, an academic institution and by implication to an academic research environment. Drawing on the earlier review of the literature, I observed a relationship between academic and non-academic clinicians in their beliefs about, and use of, evidence in practice. To investigate this further, I selected three orthopaedic departments including a teaching hospital, a non-teaching hospital and another designated academic orthopaedic department located within a teaching hospital.</p> <p>This could also be viewed as theoretical sampling, as I predicted that there may be some relationship between teaching, research and practice and evidence use in each case. However, I attempted to maintain the notion that there was no theory under consideration, this relationship (positive, negative or non-existent) forms one of many avenues of investigation. Pettigrew (1990) suggested that researchers should select cases which represent extreme situations and polar types, where the process of interest is transparently observable. Therefore, the goal of my sampling was to choose cases that were likely to extend emergent ideas present in existing systematic reviews of literature (Grove et al, 2016).</p> <p>Within each case, I took a multi-level case study approach at three vertical levels within hospitals: the managerial, the non-clinical (to include all types of administrators) and the clinical. This multi-level approach allowed for analysis of the interdependence between these organisational dimensions (Pettigrew, 1990). At the managerial level, I was able to assess how managers and members of the hospital board understood, discussed and implemented new evidence and dealt with associated issues. I spent time within hospital departments to appreciate how groups of administrators and associated surgical staff talked about, interacted with, and</p>

	<p>mobilised knowledge and evidence. Within each case, I focused on how procedures and decision choices were received and produced by individual surgeons, and their beliefs about the importance of different types of knowledge and evidence in decision-making.</p>
<b>3. Crafting instruments and protocols</b>	<p>Multiple data collection methods are typically used in case studies. The rationale for this is similar to other empirical research where triangulation across multiple data collection methods is possible and provides corroboration of constructs and results (Eisenhardt, 1989). Using multiple methods to support or refute the findings helps to understand the developing theory underlying the relationships observed, whilst also enhancing confidence in the results. In each case, I planned to conduct interviews, analyse documents and conduct observations. Nine separate data sets were recorded and included in the final analysis. I followed the road map method to be as systematic and transparent as possible in the collection of data (Mays and Pope, 1995). I developed instruments and protocols for the three data collection methods prior to entering the field.</p>
<i>3a. Interviews</i>	<p>I conducted semi-structured interviews with key participants within each case to encourage the emergence of theory from my data. A draft topic guide was developed, and this was granted ethical approval at each Trust. The topic guide was piloted on a small group of staff (n=3) with the necessary amendments made prior to its use in the larger scale study (see Appendix 5). This process helped me to avoid confusion or bias in the wording of the questions and prompts, and the participants could ask for clarification where necessary.</p> <p>In interviews, I sought to understand the approaches and beliefs of participants regarding evidence, in order to reveal the strategies used by professionals when making decisions. Questions explored the extent of professionals' beliefs regarding NICE and the involvement and impact of clinical guidance on surgical practice within their hospital. The semi-structured format meant that participants were free to expand on topics of interest. I wanted to discover what professionals considered to be evidence and knowledge in practice, rather than focusing on any pre-existing definition which may have limited my research findings. All interview information was detailed in an interview database created prior to data collection.</p>
<i>3b. Document analysis</i>	<p>A document log database was developed to record each document obtained. This included the date it was developed, received and its intended purpose. As the case progressed, documents collected were scanned and saved electronically for further reading and inclusion in data analysis. Documents helped to set the scene for each case and allowed me to understand the local context of decisions made within each Trust. As a minimum, I set out to obtain the hospital Care Quality Commission (CQC) report, the hospital annual reports, papers from at least one hospital board meeting and one departmental meeting, in addition to the local hip replacement policy and clinical pathway. Where possible, I would collect papers from meetings with local Clinical Commissioning Groups (CCGs) and other stakeholder groups. I set out to obtain papers from the NICE board meetings that took place nationally, when they were within the region of my three hospitals. Supplementary documents deemed relevant to each case were also recorded in the document log as the study progressed.</p>
<i>3c. Observations</i>	<p>Within each case, I conducted a period of in-depth observation. An observation log was created to record the demographic details, such as the date and time of observation and the setting and participants being observed. The observations were planned or on an <i>ad hoc</i> basis, to maintain the flexible approach of my research. I took a progressive focusing stance. This was important to allow me to examine areas of interest or to follow particular events as they unfolded in the field. I developed a field note template to record a summary of the observation, the setting and atmosphere, key moments, my raw notes and reflexive accounts and analytical comments during the observations.</p>
<b>4. Entering the field</b>	<p>During case study research, there is often an overlap between collection and the analysis of the data. This flexible approach is a key feature of case study research and allowed me to adjust data collection processes as the study developed in the field (Eisenhardt, 1989). Overlap and flexibility enabled me to further investigate emergent themes and take advantage of special opportunities that arose. It was important to</p>

	<p>maintain reflexivity throughout the field work to allow for additional insights to be made during data analysis.</p> <p>In the first instance, I aimed to conduct three months of field work at each site. In reality, this was influenced by the time at which data saturation was reached, as analysis and other data collection could take place concurrently. Patterns in the data became evident as my second case progressed, and become more prominent in the third. When I entered the field in my third case I felt more confident and able to understand the processes, language and practices within the hospital. In cases two and three, I was able to adapt my field work to obtain data to support a point or to examine issues which appeared interesting or deviant in each case.</p> <p>Throughout the field work, I aimed to understand each case individually and in as much depth as was feasible. I took advantage of the flexible data collection methods and made adjustments where required during the process. I followed avenues of interest and themes that became important only once the field work had commenced. During this time, my data collection remained as systematic and transparent as possible through the use of the pre-planned databases and templates.</p>
4a. Interviews	<p>Interviews were planned with approximately 60 participants selected from various levels within the orthopaedic departments of the three hospitals (clinical academics, consultant grade staff and surgical trainees [ST 5-6]). I interviewed senior orthopaedic nurses, allied health professionals, theatre staff and department managers and administrators to achieve a system-wide perspective. Care needed to be taken in reporting findings from these different staff as samples were small and individuals were possibly identifiable within sites. My interview questions followed up particular points relevant to the research or emerging theory; often these questions were not planned, but instead became relevant as the interviews occurred, as suggested by Stake (1995). I drew out relevant concepts in the interviews without explicitly stating the aim of the work or questions, to allow themes to reveal themselves and in order to reduce the possibility of interviewer bias.</p> <p>Where possible, I attempted to interview members of the Community of Practice (CoP). CoPs can have an impact upon the mobilisation of knowledge within and across healthcare organisations (Lave and Wenger, 1991; Contu and Willmott, 2003), and interviewing participants who were part of the CoP was important to try to understand how knowledge was transferred in and out of groups.</p> <p>In the interviews, I gathered professional narratives around the influence of pre-existing regulatory practice, and explored the importance, implementation and integration of evidence in practice. I sought to discover the objectives of individuals, groups and organisations in the decision-making process and to allow comment on the interaction between professionals and other stakeholder groups, for example hospital management or commissioners. In addition to the hospital interviews, I conducted supplementary key informant interviews (KII) from clinical guidance producers such as staff at NICE and the British Orthopaedic Association (BOA). This was to gain a wider perspective of 'evidence-based orthopaedics' across the larger orthopaedic and policy communities.</p>
4b. Observations	<p>Given that evidence and knowledge are tacit as well as shared face-to-face in real time, it was necessary to complement interviews with observation in the field. My primary aim was to observe knowledge sharing and evidence implementation within the orthopaedic community as problems and treatment decisions arose, hence the observations were focused. Observations were crucial as they allowed me to really immerse myself in the field and to develop a rapport with individuals. It was through the observations that I learned and reflected upon how case study departments functioned day-to-day, to provide me with much of the contextual information for my analysis.</p> <p>To add to my understanding, I attended internal meetings, such as commissioning, monthly departmental, clinical audit and quality and innovation meetings within each case study. Observations also consisted of opportunistic shadowing on the wards, watching clinic and teaching sessions and attendance at planned operating sessions, particularly the pre-theatre preparation time. Other parts of daily work were observed, including meetings and seminars, lunch and break periods and <i>ad hoc</i></p>



	<p>teaching of junior staff. During this time, I sought examples that demonstrated how mobilisation of knowledge was hindered or facilitated within each case. The observations also allowed for more informal discussion with the surgeons and staff as they went about their daily tasks and provided me with the opportunity to ask why certain actions or processes and decisions occurred.</p> <p>To supplement the hospital observations, I attended many peripheral events throughout the twelve-month period. This included conferences and meetings organised by external stakeholders including the Department of Health, NICE, Royal Colleges and project teams at the associated Clinical Commissioning Groups (CCGs). These events were useful in providing the regional and national context for my research.</p> <p>Where possible during the observations, I made hand-written notes and diagrams recorded in field journals. These field notes provided a running commentary about what was happening during the observation, but also included my personal reflections and notes about analysis that I felt were important. When it was not possible to take notes, for example when I felt it would change the atmosphere of the observation, I wrote them up as soon as possible after the observation period had ended. Following this, I completed the field note template to ensure that I maintained a similar depth and breadth of observation across my cases. The templates reported my observations but also were reflexive, asking questions such as 'what am I learning?' and 'how does this case differ from the last?'</p>
<i>4c. Document analysis</i>	Additional relevant documentation was collected to supplement planned document collection. This included government policy documents, national and local clinical guidance and published or unpublished information made available to me during the field work. The analysis of these documents helped me to understand and frame the intentions of practice change or issues within the orthopaedic departments, and to provide a wider understanding of the context within which decisions were made.
<b>5. Analysing within and across case data</b>	The three types of collected data were analysed separately before being integrated together to form each case. I describe the planned analysis techniques below:
<i>5a. Interviews</i>	<p>The delivery and management of healthcare and the decision-making that takes place are often value-laden (Esterberg, 2002). Interviews enabled me to discover how participants understood or responded to evidence and the values they attached to different types of knowledge. These interpretations helped me to identify a level of meaning and interpretation that would not be accessible through other data collection techniques. I selected thematic analysis as my main method of analysis, as I was concerned with the narrative that the participants held and shared within their CoP and hence the commonality of views between my participants (Bernard and Ryan, 2010). I included interviews to exemplify the participant's voices about the topic rather than my own personal interpretations, which is consistent with my pragmatic epistemological approach.</p> <p>I took an abductive approach to analysis of the interview data (Mantere and Ketokivi, 2013). The process of thematic analysis follows various stages that occur in sequence, but there was some moving backwards and forwards in the process. I supported the thematic analysis by reading and checking the collected documents and observation notes I made. They acted as a reminder and cross-reference to specific points mentioned in the transcripts.</p> <p>Stages of thematic analysis included transcription, data familiarisation, coding and developing categories from codes (Pope and Mays, 2000). Once the categories were identified, they were interpreted and developed into the key themes of research. This was achieved by cutting and sorting the categories, developing word lists of similar phrases and identifying key-words-in-context that could allow me to group the categories into appropriate themes (Bernard and Ryan, 2010). During the analysis, I searched for repetition within the text to identify narrative connectors and consider where there could be missing examples in each case. Throughout this process, I highlighted examples that I believed would exemplify each of the themes.</p>

<p>5b. <i>Observations</i></p>	<p>Field notes from the observations were transcribed into the observation template and synthesised with the aim of providing a rich picture of each case. I sought prominent and emergent examples of where, when and how evidence is used and implemented in decision-making in practice (Mays et al, 2005), and also of how groups from different professions and levels within the organisation contributed to decisions. I aimed to follow this through in the analysis by grouping the observation examples around the emergent issues, looking for similar or contrasting themes.</p> <p>I took a similar approach to that used in the analysis of the interview data, I read and reread the templates looking for codes, categories and themes. I was able to refer to the themes identified in the interviews, but also searched for data items that were a code or category in their own right. This added to the overall richness and later interpretation of the data. I searched the observation data for 'key moments' that could be used to support the themes and to describe and evidence the findings. Throughout this process, I was able to refer to my field notes to reinforce my thinking and to act as a reminder to the reflective notes I made during the observations.</p>
<p>5c. <i>Document analysis</i></p>	<p>Document analysis was conducted in stages, first searching for the fundamental information (Bowen, 2009). This included the descriptive information included in the document database (for example the author and audience) but also searching for why the document was composed. I aimed to discover whether the document was produced as evidence in itself or whether it aimed to convince or motivate others to use a type of evidence. It was important to understand the intended audience and the key messages in the document. This helped me discover the assumptions of the author about the intended reader, and the relationships between the individuals or organisations who accessed the document.</p> <p>The second stage involved asking the less obvious questions, for example 'what are the assumptions and values in the document?' (Bowen, 2009). I analysed whether the assumptions and values were explicit or if the person reading the document should infer them. I looked for concepts the author believed the reader would share, including key words, terms or particular use of insider language. For example, 'Was 'evidence' used to refer to published scientific evidence or to local learning?' Finally, I asked myself more reflective questions about the document, such as: 'Can I believe this document?' 'Do I believe its assumptions are true?' 'What can I learn from document?' and, 'Does it have any personal meaning for me?' This last question was important as it allowed me to identify key documents or sections which supported or refuted the themes that developed from the observations and interview data analysis.</p>
<p>5d. <i>Within and across case study analysis</i></p>	<p>A number of data analysis iterations took place in my development of the key themes across the whole case study. I reflected on my perceptions of the observations and the issues evident in the interview and documents analysis. I re-read my notes, transcripts and documentation to fully immerse myself in my data. Towards the end of the analysis I further analysed and cross-referenced the coded data extracts for their empirical relevance, internal consistency and thematic relationships. This helped me to develop categories and themes across the entire data set to summarise the individual cases. Throughout the process of analysis, I worked from the relevant passages of transcribed text from interviews, observation templates and documents to identify emergent themes, detailed descriptions, accounts, beliefs and shared assumptions. This enabled me to develop an overarching framework which captures my entire research findings. By combining multiple methods and empirical materials in this way, I hoped to overcome the weakness or biases that emanate from a single method (Dixon-Woods et al, 2004).</p> <p>To make the results tangible I produced detailed case study write-ups for each site. These provided pure descriptions of the current situation, but were central to generating insight (Pettigrew, 1990). They also helped me to condense the very large amount of data I had collected by this stage. The aim of this step was to become familiar with each case as a standalone entity (Eisenhardt, 1989). This process allowed patterns within the cases to emerge, and allowed me to develop familiarity across all the cases together. The aim of the whole case comparison was to search for further patterns in the data beyond those I had discovered through analysis of the individual data sets. It was important for me not to develop premature and false conclusions early in the analysis, as this would reflect information-processing biases on my part (Miles and Huberman, 1984). I achieved this by examining the data in</p>

	<p>different ways, for example I selected individual categories and themes and then looked for within-group similarities and inter-group differences in the other cases. Where possible, I compared several categories at once and then listed similarities and differences between each category to enhance my overarching findings, for example in comparing the professional identity of the individuals across the cases.</p> <p>I compared the data by data collection method to investigate the unique insights obtained from the different methods. I was able to see whether findings from the interviews were supported by observations and document analysis and vice versa. According to Eisenhardt (1989), when the evidence from one source corroborates a pattern from another, the finding is stronger and better grounded. I searched for examples of where data from different methods conflicted, as it provided an interesting opportunity for me to investigate the meaning of the differences. This comparison process forced me to develop a more sophisticated understanding of my data, as it made me break down the individual themes and initial ideas that I had developed in the early stages of data analysis (Yin, 1984; Eisenhardt, 1989), allowing me to form new categories and concepts across the cases that I had not anticipated until I examined the bigger picture. This process also improved the accuracy and reliability of my findings as the final themes represent a close fit to the data.</p>
<b>6. Shaping hypothesis</b>	<p>Throughout steps 1-5 of the road map method, the overall impressions, themes, concepts and relationships between the data sources, and then between the cases, began to emerge (Eisenhardt, 1989). The next three steps required a higher level of interpretation to allow a theoretical explanation of the results.</p> <p>In my research, the themes generated from the observations, interviews and document analysis were combined. I was able to develop an understanding of the real-world use of evidence in orthopaedic decision-making and of how the mobilisation of knowledge factored into variation in practice. The depth and breadth of this analysis has produced results which will be more meaningful in the context of orthopaedic practice. It is important to note that the triangulation of my data helped to facilitate the validation of my data through the cross verification from more than two data sources (Olsen, 2004).</p> <p>I compared the overall findings with the evidence from each case systematically in order to assess how well or poorly each fits with the other. The aim was to develop an overarching understanding about the phenomenon I investigated. To achieve this, I went through a process of constantly comparing the emerging theory with the data, searching for similarities but also for differences that I could explain in a reasoned way. According to Eisenhardt (1989), a close fit to the data is important to building good theory because it takes advantage of the new insights possible from the data and produces an empirically valid theory.</p> <p>Shaping theory required two steps. In the first, I refined the theoretical constructs and collected examples from within each of the three cases to measure the strength of each construct. For example, achieving a definition of what constitutes evidence for orthopaedics required me to search within data categories to find similar meanings and interpretations. This occurred through constant comparison between the data and the developing constructs so that evidence from different data collection methods converged on a single well-defined construct (Eisenhardt, 1989). In the second step, I ensured that the emerging relationships between the constructs fitted well with the data in each case. The underlying assumption of this process is that a replication of findings and constructs across the cases confirms or disconfirms the developing theory (Yin, 1984). The cases which confirmed the relationships enhanced my confidence in the results. This process also provided an understanding of the dynamics underlying the relationships between the findings and helps to demonstrate the theoretical reasons for why the relationships exist. This helps to increase the internal validity of my results.</p>
<b>7. Enfolding literature</b>	<p>The penultimate step in the roadmap required me to compare my findings with previous literature. I looked for similarities and contradictions and tried to develop an understanding of why they existed. The aim of this stage was to provide deeper insight into the emergent theory and to discover the reasons for possible disagreements (Eisenhardt, 1989). Where my findings supported the literature, it helped to develop and extend theories related to knowledge mobilisation more</p>

	generally. However, it was also important to state the limits of my research and its generalisability, for example cases might be limited within a certain field of literature. The result of this stage is that the theory has stronger internal validity, wider generalisability and a higher conceptual level.
<b>8. Reaching closure</b>	The final step of the process is known as reaching closure. This is the point when theoretical saturation has been reached, in the same way as reaching saturation in my data collection and analysis. This point signifies the end of the analysis where only small gains were being made in my thinking and interpretation of the findings. This is also the point at which I would need to collect additional data to allow me to test my findings and theory in another field. An example would be testing the theory in a different group of orthopaedic departments to see if my findings held true. For my research, theoretical saturation was reached and I believe that I summarised and reported the data in its entirety.

A detailed protocol of the study was published in Implementation Science and is available to download. I have provided a copy in Appendix 1. The citation is as follows:

*Grove, A., Currie, G., and Clarke, A., 2015. The barriers and facilitators to the implementation of clinical guidance in elective orthopaedic surgery: a qualitative study protocol. Implementation Science. 10(1)81 DOI 10.1186/s13012-015-0273-6.*

### **3.3.2.2 Ethics**

Ethical approval was granted by the University of Warwick Biomedical Research Ethics Committee on the [reference no: REGO-2014-645] and via the Research and Development (R&D) department of each of my three hospital sites (Appendix 3). All participants gave informed consent to take part in the interviews, and consent to conduct observations was obtained by the lead R&D representative at each Trust.

### **3.3.2.3 Sample**

A case study design with mixed qualitative methods was used. A description of the three cases is provided in Table 5. The regulatory healthcare context at the time of study is presented in Box 2.

**Table 5. A description of the three cases included in my study**

<b>Case</b>	<b>Hospital description</b>
<b>Case A</b>	Case study site A is specifically designated as an academic orthopaedic department and orthopaedic trauma centre linked to an Academic Health Science Network. The department works in partnership with the local University Medical School and is also a teaching hospital. There is an integrated clinical academic training scheme in orthopaedics. The research team conduct effectiveness and cost-effectiveness studies, mainly national RCTs, of various techniques and treatments within orthopaedic surgery. The clinical service provides

	specialist musculoskeletal care alongside the departments of Rheumatology, Physiotherapy, Radiology and Paediatrics. The clinical staff comprise consultants, clinical fellows, specialist registrars and allied health professionals (AHPs). Many of the surgeons hold joint academic/clinical posts at the Trust and the University.
<b>Case B</b>	Case study site B is small District General Hospital Trust with a specialist practitioner physiotherapist service. Site B operates as a split site, therefore the services are separated across two hospital buildings which are approximately 20 miles apart. This site is not affiliated to an orthopaedic academic department or University and is not a teaching hospital. The clinical team provide general orthopaedic services to the local population and are supported by a group of designated AHPs who provide a specialist musculoskeletal assessment interface between General Practitioners, patients and the orthopaedic department.
<b>Case C</b>	Case study site C is a large orthopaedic department in a teaching hospital Trust with specialist trauma centre. Unlike site A, it is not a designated academic orthopaedic department with a specific clinical academic training scheme. It is one of the largest orthopaedic surgery units in England and receives national referrals for complex hip implant revision surgery. The clinical department provides a range of orthopaedic treatments and surgery delivered by a multidisciplinary team of specialists. Site C is a teaching hospital and therefore has a small academic team that carries out research, development and training, for example site C acts as a 'spoke' data collection site in national RCTs. Clinical professionals at site C may or may not participate in academic work, depending on their own capacity and willingness.

**Box 2. Study regulatory context: ODEP rating and Best Practice Tariff (BPT) rating**

ODEP at the three hospital cases

Within orthopaedic surgery, one of the largest comparisons is data (Orthopaedic Device Evaluation Panel) that is collected to monitor the evidence rating of implants used in hip replacement surgery. The three hospitals included in my study had ODEP ratings that achieve the national standard. This suggests that none of the hospitals were deviating from the evidence-based recommendations in terms of implant selection decisions. However, there were differences in the data, which hospitals could use for benchmarking purposes. I have presented data below (Table B1) to provide an overview of variation in the use of implants across the three sites during my study period. It is important to note that this data does not distinguish between high and low ODEP evidence ratings (10A-3B) as it represents a threshold (the implant had received a rating) rather than a ranking (i.e., what the rating actually was) (see Appendix 2 for a general explanation of ODEP ratings).

**Table B1. Use of ODEP rated implants for elective THR as reported in the NJR. Data for 1<sup>st</sup> April 2014 to 31 March 2015.**

Implant type	No. of primary procedures using an ODEP rated implant	No. of primary procedures without use of an ODEP Rated implant	% of procedures using an ODEP rated implant
Hip stem Site A	429	3	98%
Hip cup Site A	433	2	99%
Hip stem Site B	358	2	99%
Hip cup Site B	358	0	100%
Hip stem Site C	433	0	100%
Hip cup Site C	436	0	100%

(Doc analy ODEP Trust data 2014/2015 <http://www.njrreports.org.uk> 280416)

BPT at the three hospital cases

Table B2 shows a comparison of the BPT data for the three hospitals I examined during the 12 month data collection period. All sites were compliant with BPT guidelines, achieving over 75% compliance with NJR data collection and below 25% of cases where consent was listed as 'not known'. This replicates the findings regarding compliance with evidence ratings in relation to ODEP. However, in the BPT data there was some variation in practice. Site A out-performed both B and C. Site B performed slightly better than C in terms of compliance, but notably better for consent 'not known'. I have included the data on number of procedures to demonstrate that the rate of surgery taking place at each of the three sites was comparable. Hence this is unlikely to be the reason for the observed variation.

**Table B2. BPT Primary hip and knee replacement outcomes data for sites A-C**

Date	Site	Compliance No. of Hip and Knee Procedures	Compliance Hips	Consent No. of Hip and Knee Procedures	Consent Not Known Hips
12 Dec 14	A	1,419	95%	1,480	0%
17 Mar 15	A	1,473	92%	1,558	0%
22 June 15	A	1,558	91%	1,599	0%
12 Dec 14	B	1475	85%	1412	1%
17 Mar 15	B	1546	88%	1575	2%
22 June 15	B	1566	88%	1428	4%
12 Dec 14	C	1393	86%	1458	10%
17 Mar 15	C	1404	84%	1447	11%
22 June 15	C	1412	83%	1498	14%

(Doc analy NJR NHS Trust data 2014/2015 <http://www.njrreports.org.uk/Best-Practice-Tariff> 280416)

#### **3.3.2.4 Participants and settings**

The participant sample was purposive. A snowball sampling technique was also used to support this. The sampling frame was identified from staff contact lists at each of the hospital sites. This included clinical and non-clinical administrative staff and hospital managers (see Table 6).

**Table 6 A matrix representation of the three vertical levels of participants within each case**

<b>Hospital location</b>	<b>Case A</b>	<b>Case B</b>	<b>Case C</b>
	Managerial	Managerial	Managerial
	Non-clinical	Non-clinical	Non-clinical
	Clinical	Clinical	Clinical

Site lead contacts were the Trauma and Orthopaedic Leads/Managers who represented each hospital Trust and assisted in participant identification. I invited approximately equal numbers of people from each group (clinical, non-clinical, managerial) and from all three organisations to be interviewed. Total final numbers interviewed were 30 clinical staff, 15 non-clinical staff and 11 managers. As planned, I did not interview patient participants. Individuals who participated in key informant interviews (KII) were selected from local and national stakeholder organisations.

##### **3.3.2.4.1 Interviews**

Initial invitations were sent to each identified participant. Emails detailed the nature of the study and what would be expected of them. The study participant information sheet was attached to the email (Appendix 4). If interest was indicated, I sent a follow up email outlining how the interviews were structured and the topics which might be discussed, and arranged a time and place to meet the interviewee. In snowball sampling, participants would suggest colleagues with whom I should make contact to try to arrange an interview. Often these

individuals played a key role in delivering hip replacement services but were not easily identifiable through the organisation's website.

Interviews took place between December 2014 and December 2015. Each interview was digitally recorded and transcribed professionally. A hard copy of the consent form was signed before the planned interview commenced, or verbal consent was obtained for *ad hoc* interviews. During each interview, I followed my topic guide (Appendix 5). The guide was divided into two parts. The first included structured questions aimed at obtaining general information about the individual's role, responsibilities, time in post, position within the hospital, academic links and external positions, for example if they sat on a hospital board or national organisational committee. The second included unstructured questions about the participant's overall experiences, beliefs and attitudes towards evidence and clinical practice. Each interviewee was immediately given an ID label to maintain confidentiality. Labels were divided into three groups within each site, hence each of the three sites A, B and C contained interviews from 'C' (clinical), 'A' (non-clinical administrators) and 'M' (managers).

Of the 102 formal requests for interview that were sent (purposive and snowball sampled), 50 participants agreed to be interviewed and 48 interviews actually took place. Of the two drop-outs, one failed to attend for the interview and the second was unable to find a suitable time for interview during the three-month period when I was located at the Trust. Of the further 52 formal requests which did not result in interviews, most people did not respond and a small number declined due to lack of time available. These figures do not include the 16 *ad hoc* interview requests that were made during observations at each site. Often, these were completed there and then, such as after observations of meetings or during coffee breaks.

As planned, there was a relatively balanced number of participants from each of the sites and across the three professional groups. Please see Table 7 for a breakdown of these participants.



**Table 7. Participant numbers detailed by site and by professional group**

Professional group	Site A	Site B	Site C	KII (from local and national stakeholder organisations)
Clinical (C)	12	10	8	4
Non-clinical (A)	4	5	6	2
Managers (M)	2	4	5	2
Sub-total	18	19	19	8
Total	64			

Interviews ranged from 28 minutes to 1 hour 35 minutes (one hour on average). Most interviews were conducted in offices, personal and shared, located within the hospital Trusts. Some interviews were undertaken in the hospital coffee shop or canteen at the request of the participant (for example if they shared an office and did not want to be overheard or disturb colleagues). All of the eight KII interviews were conducted off NHS Trust sites, such as at the offices of NICE, the CCG offices and at national conferences located across the country.

#### *3.3.2.4.2 Observations and document analysis*

At each site, approximately three months of observation took place. This time did not include weekends, time dedicated to other academic commitments or periods of annual leave, hence overall observation time represented just over one full calendar year from 1<sup>st</sup> December 2014 to 11<sup>th</sup> December 2015.

Observations ranged from 7.00am to 8.00pm, to include morning and evening meetings that were often scheduled outside traditional core working hours. Site A observation was conducted first, between 1<sup>st</sup> December 2014 and 1<sup>st</sup> February 2015; site B took place between 1<sup>st</sup> March 2015 and 30<sup>th</sup> June 2015 and site C between 1<sup>st</sup> July 2015 and 11<sup>th</sup> December 2015. Observations in Site C were for an extended period of calendar time to compensate for my other academic commitments taking place during this time. However, my actual time dedicated to data collection was similar in all three sites. This was to ensure consistency across data collection.

An outline of the key documents included in the analysis is provided in Table 8. Reading and referring to these documents throughout my time at the organisations, and afterwards during data analysis, enabled me to understand

the wider context of the hospitals and to help frame the decisions that were made. For example, board meeting reports stated the financial situation of the hospital and/or where planned cuts would be made, which allowed me to understand the financial pressures facing management teams responsible for purchasing orthopaedic implants.

**Table 8. Document type and quantity by case study site**

Document type	Site A	Site B	Site C
Clinical pathways	5	3	6
Protocols	17	2	4
Meeting notes	7	5	11
Strategy documents	2	1	0
Quarterly and annual reports	14	18	17
Internal presentations	2	5	2
Sub-total	47	34	40
Total	<b>121</b>		

### **3.3.2.5 Validation**

I ensured rigour in my research in relation to the reliability, consistency, auditability, validity, credibility, applicability and neutrality of my qualitative data throughout the data collection process (Sandelowski, 1986; Mays and Pope, 1995; Creswell, 2009). I read through each transcript whilst listening to recordings and noted any mistakes and comments on the printed-out document. I crosschecked transcription errors as I coded and analysed the data. To ensure that initial coding reflected the data and not any interpreted meanings or definitions, I coded one interview from each of the three participant groups as they became available. This produced an initial list of potential codes for each group. Following this, I was able to revise redundant codes and to refine unclear codes as I proceeded to code the remaining interviews. To ensure consistency across the coding, one transcript was selected and reviewed by the supervisory team early in the process to assess my original codes.

All participants were asked if they would like a copy of their transcript to ensure that the data provided an authentic account. All but one participant declined, instead some opted to receive a copy of the final research executive summary.

As a concluding stage in determining authenticity, I presented the results of the research and a summary of themes to each hospital Trust prior to ending the period of observation. This allowed me ask the participants if they recognised my findings as a true account of their organisation. It also enabled me to obtain further feedback and reflections on the research findings. This feedback could itself act as a source of data. To identify discriminant validity, I noted disconfirmatory cases within and across each site to ensure the range of views present in the analysis was represented. Outliers will be discussed in the following results chapters.

#### **3.3.2.6 Data coding process**

A professional transcriber transcribed the interviews verbatim. Once the first batch of transcriptions was complete, I was able to conduct an initial read-through of a printed copy of the interviews. This familiarisation process enabled me to get to know the data and the narratives that were beginning to emerge across the data. I read the transcripts in the order that they were received. This approach allowed for progressive focusing, where interviews in the later stages of the data collection process were able to focus down on particular issues of interest (Parlett and Hamilton, 1976; Stake, 1995).

All data was uploaded and stored in NVivo 11 (QSR, 2015), in order to help code, sort and analyse the data. Documents collected as part of the document analysis process were also uploaded into the database, according to site reference. Observation field notes were hand-written in field journals and hence were not uploaded into the database as text files. These notes were used to support my analysis and framing of the situations I observed. Examples I used were taken directly from my observation log and were selected and transcribed personally.

I selected one interview from each group (n=3) as available and coded each one line-by-line using the highlight and nodes features of NVivo 11. These codes represented varying levels of abstraction in the data. As an example, codes such as 'implant selection' reflected high-level coding whereas 'changing innovators' used the exact words that were present in the transcript. An initial coding framework was developed throughout the coding process. This acted as a

thought aid to help structure the new and developing codes as they emerged during the data collection.

Once all transcripts had been coded, 404 individual codes had been generated. I assessed the similarities and differences between codes and expanded or collapsed them into groups where appropriate. These codes were presented to the supervisory team for discussion. After this process, 328 codes remained. The fully-developed coding framework was used to help organise the 328 codes into larger categories. This next stage of consideration resulted in 29 categories, which enabled me to collapse codes and reduce the overall number. A category summary description was produced to enable me to explain the meaning of the category and the codes it represented. This helped me to remain consistent throughout the process of data collection and analysis, which occurred simultaneously at each site and sequentially across the three sites. Presenting the codes and category summary ensures transparency in the data analysis and helps to establishing the robustness of the research process. Table 9 presents the final categories and corresponding codes of the data. Throughout this coding and categorisation process, I noted points of interest and queried parts of text; I referred to these notes as reflexive coding summaries. I was able to refer back to particular sections of key documents and the field journals that reported my thoughts after the interviews had been conducted. These helped me to further interpret my reflective account of what was said and how it linked to my developing ideas.

**Table 9. Final categories and codes in thematic analysis**

Category summary	Codes included
<b>Group decisions:</b> decisions made by more than one person	Stakeholder meetings, Group decision, Multidisciplinary decision making, Stakeholder complexity Different views, Conflict, Collective decision-making, Collaboration under competition, Multidisciplinary engagement
<b>Exceptions:</b> instances and examples of when normal practice did not occur	Clinician not response, Variation for a special case, Clinician error, Confidence in ability (to make an exception), Deviant behaviour, Deviate from guidelines, Make exceptions, Special care surgeon, Just in case decisions, knee jerk decisions, Confidence to disobey guidelines
<b>Cost:</b> any reference to cost or finance that included a decision	Cost rationalisation, Service improvement driven by cost, Loan kit cost, Surgeon knowledge of cost, Cost based decisions, Cost as a driver to change, Cost and efficiency, Volume and cost decisions, Cost versus quality, Value for money
<b>Learning on the job / mentor:</b> examples of learning or knowledge acquisition from a respected other	Role model, Apprenticeship, Mentors, What I was trained in, What my consultant taught me, Knowledge acquisition, Learned in practice, Learned from Seniors, Learn on the job, Sharing information
<b>Personal experience:</b> examples of a person's prior experience that influenced their decision making	Its established practice, Typical patients do not need evidence, The way we do it, It becomes normal, Personal experience, What I've always done, Surgeon philosophy, It worked before, Light bulb experience, Experience over implant, Practice based evidence, Works in my hands, My decision to operate
<b>External influence / political:</b> reference to factors outside of the organisation that could impact on practice	External influence, Changing patient demographics, Policy, External environment, Quality Care Commission, Political influence, Best Practice Tariff, Policy for cost reduction, Indemnity of implants, National priorities ODEP, Political strategy, Political conflict, Clinical Commissioning Groups
<b>Off table on table decisions:</b> examples of decisions that do not follow the norm or that can change based on contextual contingencies	What takes clinical priority, Outcomes are variable, Off table decisions, Depends on the situation, Individual versus public decisions, Inside outside influence, Layered decisions, Balancing acts, Need to balance new and old, Internal verses external problems, Just do what you like
<b>Intangible / legacy:</b> knowledge and evidence that cannot be identified in the physical form	Intangible decision, Value of legacy knowledge, Insider knowledge, Historic events, Narrative decisions, Intangible knowledge, Beliefs in treatment
<b>Compliance:</b> reference to areas where compliance and rule following is expected	Governance reporting to Trust, Monitoring, Influence of commissioners, Internal audit, Assumed compliance, Mandates from NICE, Scrutiny of outcomes, Rule following, Monitoring and reporting

<b>Leading lights:</b> instance of people who take the role of influence and whose opinions can be a source of evidence	Expert opinion, Surgeon at the policy level, Kudos, Reputation, Credibility, The face of research, National influence, Interface role, Leading light, Opinion leader, Influential people
<b>Professional networks:</b> examples of other orthopaedic surgeons acting as a source of influence over decisions	Learning from colleague, Conversations with colleagues, Only trust in surgeons, The norms of surgery Surgical community, Personal relationships, Relationship management, The 'team', Talk the same language, Peer pressure, Group think, Everyone does it, Socialised knowledge, Common knowledge, Group behaviour, Conform to colleagues
<b>Professional hierarchy:</b> reference to the impact of the hierarchy that exists within the hospital organisation	Allied Health Professionals, Management versus clinicians, Clinical lead for NICE, Differences between professional groups, Dependence on one person, Understanding professional groups, Hierarchy of staff, Professional fit, What my consultant taught me, Position in theatre, Who dictates decisions, Professional politics, Experience equals respect, Differences between groups, Role conflict
<b>Beliefs about orthopaedic surgery:</b> individuals beliefs about surgeons as a type of person and orthopaedics as a clinical specialty	Beliefs about orthopaedic surgery, Surgeons only do surgery, Challenges to orthopaedic surgery, Orthopaedics is different, Evidence based orthopaedic surgery, Clinical engagement control, Job description, Change surgeons' behavior, Job role, Play to egos, Surgeon individual differences, Surgeon autonomy, Surgeon personality, Surgeon's learning curve, Variation by specialty, Surgeon's power, Variation by area and surgeon, Surgeons are competitive, Surgeons do not understand the bigger picture
<b>Patient factors:</b> features that influence decisions that are directly related to patients being treated	Decision for patient surgery, Patient demographics, Patient factors, Patient experience, What is best for the patient, Patient evidence, What the patient wants, Patient expectations, Public expectations
<b>Training and development:</b> reference to the surgeons training and how that influences decisions that they make	Training, Develop staff to problem solve, Education, Influence of trainer, Staff development, Fellowship training, Academic credibility, Academic training, Level of training
<b>NICE-specific beliefs:</b> all references about NICE and their relevance to clinical practice and clinical decision making	Beliefs about NICE, Challenge NICE, Is NICE applicable to the Trust, Use NICE for own benefit, NICE is a carrot or a stick, Make guidance fit for purpose, Guidelines are too general, We do NICE already, Too much guidance, Open to interpretation, NICE dissemination and access, Guideline resistance, Implementation problems, Whose responsibility
<b>Implant discussion:</b> examples of evidence that influence how implants are selected for patients	Car analogies, Buying and contracting, Implant selection same for everyone, Product availability, Implant selection using hard data, Passion for a joint, Implant selection, What's in vogue, Implant selection justify to Trust, Price variation, Implant selection conflict and uncertainty, Implants made available by Trust, Shiny new kit
<b>Process internal:</b> all reference to the internal process of the hospital and how it is run as an organisation	Coding process, Feedback, Communication, Process variation, Internal protocols, Process transparency Local polices, Process black holes, NICE internal processes, System wide thinking, Lack knowledge of the process, Ownership, Traditional services, Standardisation, Pragmatic choices, Medicine is repetitive, Efficiency savings
<b>Innate drivers:</b> evidence that stems from intangible assets of the decision makers	Craft versus science, Skill versus science, Innate passion, Confidence, Fear, Refuse to change, Enthusiasm, Personal reflection, Mind-set, Perception of outcomes, Blame, Responsibility for surgery, Ownership of the process and surgery

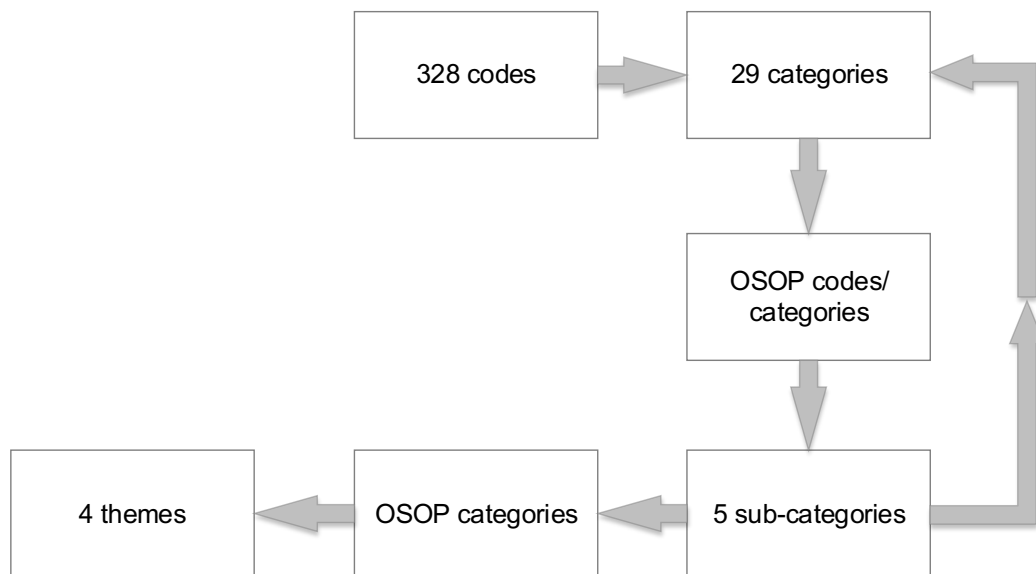
<b>Management:</b> all reference to managers working within hospitals	Management versus surgery, Non-clinical managers, Joint roles, Top-down support, Management decisions, Leaders and business style, Management influence, Management support, Management power, Board level decision-making, Management control or lack of control
<b>Organisational issues/operational:</b> all reference to the organisation and its mechanisms	Organisational benchmarking, Staffing issues, Organisational business and structure, Theatre availability, Organisational culture, Proactive versus reactive decisions, Organisational restraints, Organisational mentality, Price benchmarking, Priorities of the organization, Procurement procedure of implants, Organisational flexibility, Time constraints
<b>Evidence-based medicine (EBM):</b> all examples of evidence linked to the traditional definition of EBM	Beliefs about EBM, Learning EBM, Time to do EBM, Levels of evidence in practice, Academic influence practice, Changing practice towards EBM, Codified evidence base, Develop services based on EBM, Multiple sources of guidance or evidence, Journal articles, National drivers for EBM, Inappropriate evidence, Access to evidence, EBM limited use in practice, Attitudes towards EBM
<b>Gaming and incentivisation:</b> examples of issues that go against what would be expected within the organisation	Incentives, Hidden agendas, Tariffs, Performance not influence your pay, Playing the clinical card, Game playing, Targets, Plant the seed and let it grow, Who shouts the loudest, Tick box compliance, Incentive decision making
<b>Innovation versus routine practice:</b> reference to new technology and treatment when compared to established technology and treatment	Bad innovation, Stifle innovation, Early adoption, Tinkering around the edges, Established implant technology, Barriers to innovation, Experimental procedures, Production line services, Innovation within an RCT, Commodity services (hips), Personalisation agenda
<b>Professional societies:</b> examples of the wider community of orthopaedic surgeons acting as a source of influence over decisions	Conferences, Comparison outside, Professional societies, Benchmarking to societies, Trust in own society, Professional guidelines
<b>NHS versus private practice:</b> all reference to non-NHS work and how it influences decision-making	Influence of private practice, Private practice is different, Public versus private decisions
<b>Data / big data:</b> the importance of data as a source of evidence at all levels of practice	Internal data at Trust, Poor data quality, Trusting data, Need to access data yourself, Influence of National data, Feedback and monitoring, Data monitoring decisions, Personal data is our responsibility, Try to understand data, Baselineing, Control over data, Information is power, Data interpretation
<b>Ethics:</b> all reference to ethical issues and decision making	Ethical considerations, Faith to do the right thing, Not clinically safe (to change), Ethical decision making, Ethical targets
<b>Big Pharma. / manufactures:</b> the influence of external organisations who develop and sell orthopaedic implants on decisions that are made	Influence of manufacturing companies, Training provision, Pharmaceutical representatives, Relationships with reps, Commercial decisions, Rep access, Control over reps, Incentives from manufactures, Provision of research and evidence, Marketing influence, Loyalty to company

### **3.3.2.7 Data analysis**

I analysed the data using the One Sheet of Paper (OSOP) technique for thematic analysis devised by Ziebland and McPherson (2006). I compiled one sheet of paper for each category and listed the codes included in each category on post-it notes on the paper. This process allowed me to look for the similarities and differences of participant views. I was also able to seek out the views shared by individuals and how they were contextualised in each of the three hospital settings. Using the traditions of thematic analysis, I moved back and forward iteratively between the developing considerations and those that had been noted in my reflexive coding summaries. During this process, the categories could be separated and grouped into five smaller subgroups, where the subgroups represented particular similarities across a larger number of categories. For example, categories about 'beliefs about orthopaedic surgery', 'patient factors' and 'personal experience' could all be grouped into a subgroup called 'individual beliefs and experiences'.

To extend the analysis further, another phase of OSOP took place. For each of the five subgroup categories, an OSOP was conducted following the same process described above. These OSOP charts were synthesised together to make up the final category OSOP. Figure 4 illustrates this process in a flowchart. This stage merged into what became the theme development stage of analysis described in the case study road map.

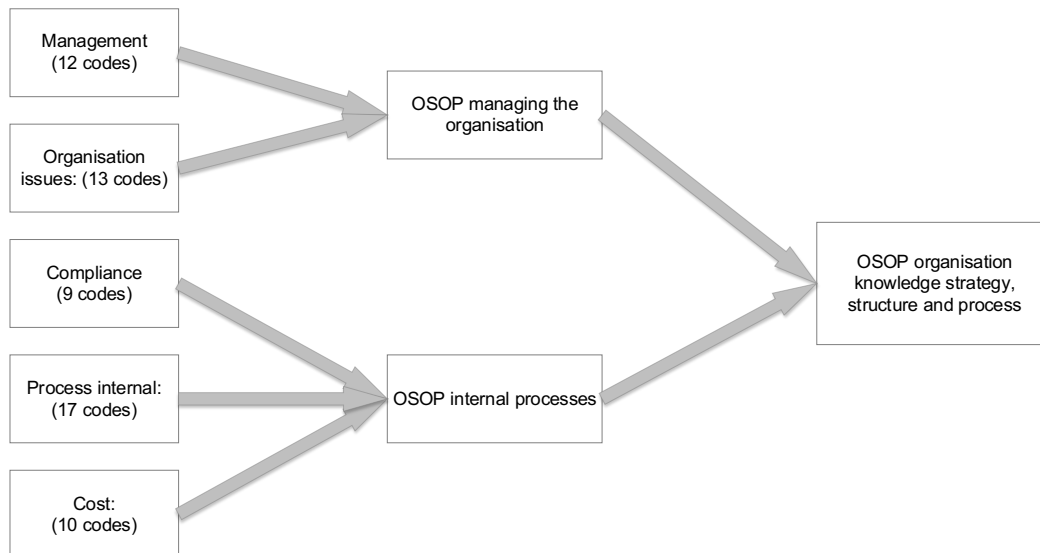




**Figure 4. Example OSOP process flowchart**

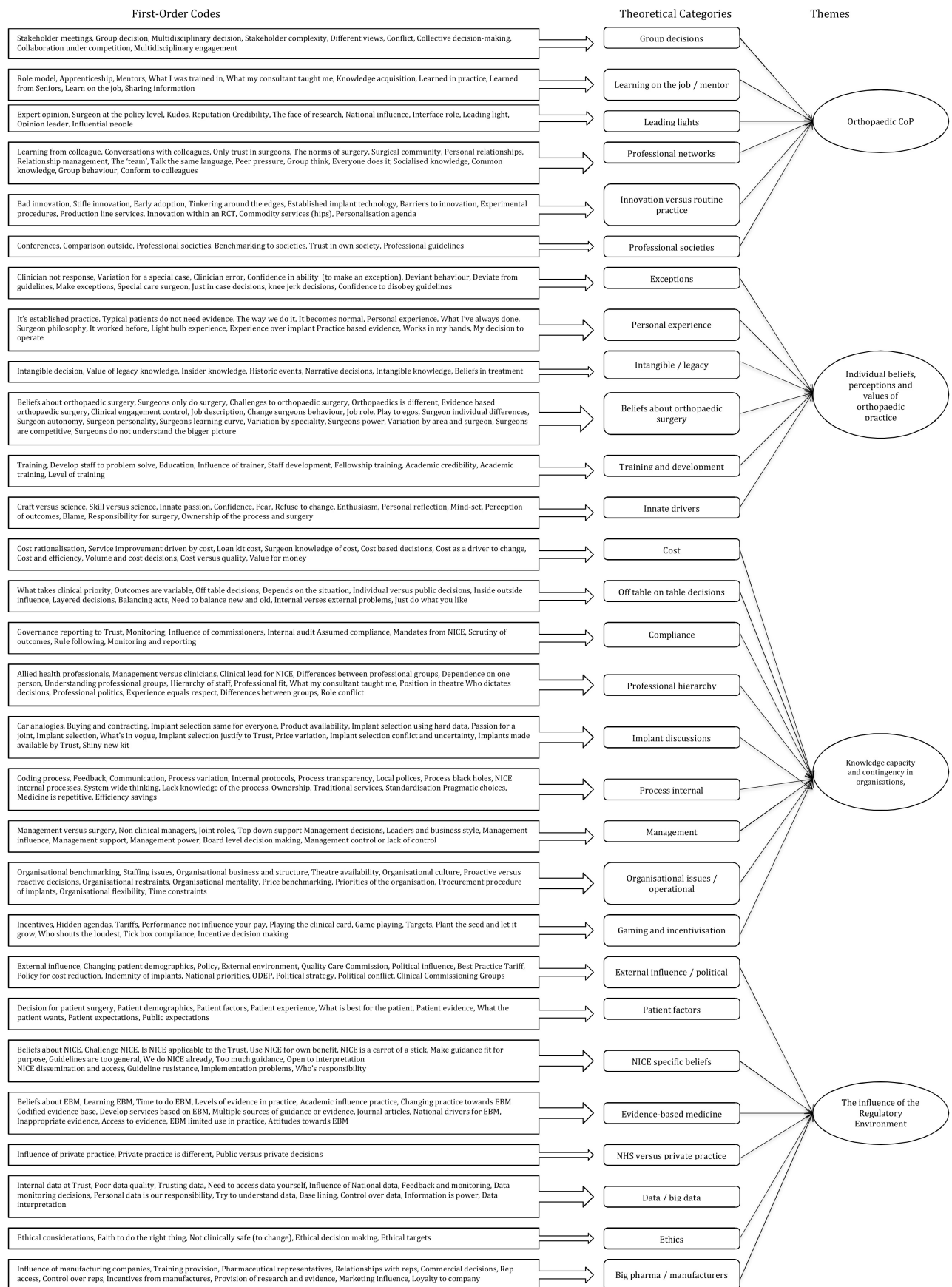
I developed each theme through an iterative process of refining emerging ideas and expanding on developing concepts presented in each of the five categories (see Figure 5 for an example of the organisation category and OSOP production). I compared the data to the theoretical assumptions detailed in the literature review. This enabled me to develop more meaningful themes which examined theoretical, empirical and practical issues in the data. I examined these clustered issues and noted similarities and differences, discriminant cases, gaps in data, the importance of context and the varying points of view between and within the cases.

Part of the OSOP technique is to develop a reflective account of the methods. To achieve this I reflexively asked, ‘what is really going on in the data?’, ‘do I believe this is a truthful representation of views and what was said?’ and ‘how might these views match or come together when compared to the views of other participants?’. Being reflexive in this way ensured I was satisfied that the analysis, and that it was a true representation of the data, rather than my personal thoughts and ideas regarding what participants said.



**Figure 5. Example of a category and its organisation and OSOP production**

An important aspect of thematic analysis is the ability to move seamlessly back and forth between raw data, initial codes, category summary descriptions and the final OSOP diagrams. Throughout the process of identifying emerging themes, I searched for quotations from original interviews, observation logs, key documents and notes in the field journals to illustrate and validate the consistency of the theme with the initial data. As recommended by Creswell (2009) I completed a final crosscheck of my interpretation of the OSOP categories with my original field journal notes and quotations. I repeated this process and reflexively recorded emerging themes until I considered that the final four themes formed a complete representation of the data. The final four themes are presented in the overview data structure diagram in Figure 6. The aim of the data structure diagram is to present the findings in a transparent fashion, therefore establishing the robustness of the subsequent narratives presented in the results chapters.



**Figure 6. Overview data structure diagram**

### 3.3.3 Thematic findings

The four themes which form the findings of my research are listed below. The structuring around individuals, groups, organisations, and environment developed *a priori* as I compared the data to the theoretical assumptions detailed in the literature review. A brief description of the themes is below:

**1. Individual beliefs, perceptions and values of orthopaedic practice:**

illustrate issues related to personal circumstance, personality and characteristic behaviour. Important in this theme are the knowledge, method of learning and understanding of individuals about sources of evidence and their influence and importance for individual practice.

**2. Orthopaedic Communities of Practice:** represent the networks and communities to which groups of professionals belong. This is particularly important for knowledge mobilisation and evidence sharing between individuals and across organisations. This theme focuses on the professional norms of this particular group of clinicians.

**3. Knowledge, Capacity and Contingency in Organisations:**

characterises the operational issues related to the hospital as a functioning organisation. These include financial status and pressure, staffing, service planning and processes. This theme covers the emphasis on achieving internal standards and how they balance with resource constraints and demands of the NHS.

**4. The influence of the Regulatory Environment:** the final theme reflects knowledge and evidence which acts upon the NHS and healthcare as a wider system. It includes the cultural and national influences which positively or negatively impact on individuals, groups and organisations attempting to deliver orthopaedic services in England.

### 3.4 Chapter summary

This chapter served a dual purpose. I described my research methodology and research methods. I described the organisation of data collection and the analysis process to demonstrate how I conducted the thematic analysis. I closed the chapter by introducing my key four thematic findings. In the next four

chapters I will demonstrate how the context and contingencies of NHS practice, and the knowledge mobilisation which occurs, can help to explain the variation in orthopaedic practice across the four levels.

Chapters 4-7 encompass the four results chapters of my thesis. Each chapter represents one of the thematic findings described earlier. The results describe the *individual beliefs, perceptions and values of orthopaedic practice*; and portray the influence of the *orthopaedic Communities of Practice* that were observed in my study. I go on to describe the *knowledge, capacity and contingency* found in the hospitals, before illustrating *the influence of the regulatory environment* in the final results chapter. I will explain within and across case differences that I found during my research in each results chapter with representative examples provided from my interviews, observation and key documents. These four results chapters provide a full representation of my data and demonstrate how evidence is used in practice and in decision-making.

## **4 Results 1: Individual beliefs, perceptions and values in orthopaedic practice**

### **4.1 Introduction**

In this chapter I illustrate the ways in which the practice of orthopaedic surgery is contingent on the individual, and the nature of variation in the work of orthopaedic surgeons. I identify what the surgeons understood to be the source or sources of variation in their practice. I examine their individual beliefs, perceptions, characteristics and values in the context of orthopaedic practice.

The use of clinical evidence derived from RCTs has developed relatively slowly in orthopaedics. In the 1990s, when the EBM movement was spreading, the evidence base for surgery was particularly weak as there were few trials comparing differing surgical interventions and techniques. When considering how knowledge spreads, it was important for me to go beyond the concepts of dissemination and translation of RCT findings and clinical guidelines. Instead, in this chapter I explore tacit knowledge, mindlines and the interactive human processes which created, enacted and shared knowledge in practice.

### **4.2 Defining concepts and determining meanings for this chapter**

In this theme, I refer back to the traditional clinical definition of EBM:

*"Evidence based medicine is the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence based medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research." (Sackett et al, 1996)*

The growth of EBM in orthopaedics began around 2000, in recognition of the need to integrate clinical expertise with the best available systematic research in the field. A few years later, one of the leading journals in the field of orthopaedics (The Journal of Bone and Joint Surgery), announced that all clinical articles submitted for publication would need to include a "level of evidence"

rating, to enable editors and readers to classify the quality of study (Obremskey et al, 2006). For this purpose, five levels of evidence in orthopaedics were defined, the lowest being expert opinion and the highest being RCTs or systematic reviews of RCTs. There has been a continuing increase in such studies in this field.

#### **4.2.1 The meaning of EBM for the orthopaedic surgeons**

The classification of evidence into a hierarchy permits research evidence to be weighted by individuals before the results are incorporated into their practice. It appeared to be common knowledge among the surgeons I interviewed. The quote below is a surgeon explaining the classifications to me:

*"So level one evidence, you know, RCTs, I think as surgeons we love randomised control trials, blah, blah, blah because we go, oh, yes, that's definitely the best, and then you get down to level five, expert opinion, which is we know best because we're always do, you know, it's anecdotal, you know, its low down." (INT C 37010)*

Many surgeons did not have the time or inclination to scrutinise even the well-presented evidence from within their field. This was despite the recent emphasis on high level evidence. The quote below demonstrates that it was not clear how the surgeons would be able to directly translate current research findings into better care for patients, either because it was too complicated or because of the large quantity of evidence:

*"So, first of all it's really complicated all right? And I think as a layperson, the lay orthopaedic surgeons, there's a massive disconnect between papers and orthopaedic surgeons' behaviours. I think it's very difficult for me to be totally up to date on all the best practice on this, that and the other. But I'm also aware that I don't look at every single thing." (INT C 37010)*

A lack of confidence in the evidence presented in journals and guidelines appeared to be an important issue. They reported being able to find evidence in an article to prove any point of view on a topic:

*"It happens all the time and often the evidence is mixed so you know that's often the situation; one person will provide evidence in favour of doing something and the other might show another bit of evidence against. And I think that happens a lot in orthopaedics because generally the quality of the*

*evidence is so weak it swings both ways.” (INT C 218011)*

In this sense, clinical evidence was not seen as one correct source of evidence, instead it was flexible and adaptable to fit the needs of the user. The codified evidence became an object which served a specific purpose for the individual, as demonstrated in the excerpt below:

*“I think the great strength of guidance is it can empower you as a doctor. So for example if the patient’s pressuring you for a particular sort of treatment you can say, look that’s not what NICE says. It really is a huge if you like big brother standing over your shoulder, telling them to go away because I can’t do that.” (INT C 218007)*

This flexible approach to evidence replicates the practice I observed in the hospitals. My data from clinical practice, meetings, conferences and encounters with surgical staff demonstrated that orthopaedic surgeons performed the same named procedures differently. Despite the evidence, a THR was not an identical procedure across the three sites. A variety of different surgical procedures were used and it was apparent that there was considerable variation in the implants that were selected and how the operations were performed. A significant factor in this selection process appeared to be the discretion and autonomy of the individual surgeon. NICE guidelines were beneficial to the clinical specialty but were seen as directly ‘attacking’ the discretion of the surgeon. How the surgeons enacted this discretion would vary, as reflected in the summary note from my observations at case C, demonstrating that multiple THR options were available within one hospital Trust:

*“Surgeons would discuss using standard total hip replacements with either posterior or anterior approaches, applying a minimally invasive technique and even using resurfacing arthroplasty when the patient was considered appropriate. A wide variety of procedures, old and new, were being used during the time of the data collection, and this appeared to be a normal practice. The differential factor in the procedure that was selected seemed to be which consultant surgeon the patient was ‘under’ and which hospital they had accessed.” (OBS notes Case C)*

It is important to state that differences were not classified as non-evidence-based practice. Variation was a normal element of orthopaedic surgery across all



three sites. The selection of treatment options seemed to depend on the contingencies of practice and the enactment of 'surgical philosophy' or beliefs, rather than what the clinical evidence suggested. These enduring beliefs were not explicit or written down for others to access. One surgeon described the importance of his 'philosophy' or belief in the selection of prostheses:

*"So my philosophy for what it's worth is I think cemented hips are brilliant, okay? So I'm very happy using a cemented hip and have those on the shelf, and then on the cup side, but I think un-cemented hips are good for younger people because I can then decide what bearing I wanted to use, that's, kind of, kind of philosophy that you've been brought up with." (INT C 198005)*

The use, or misuse, of evidence was not sufficient in itself to explain the clinical decision-making and variation that occurred in orthopaedics. It could not account for personal choice and surgeon beliefs. It is important to reflect on the factors which influenced the knowledge and evidence privileged by individual orthopaedic surgeons in my study. These were linked to characteristic surgeon types, and the beliefs and values they held about orthopaedic practice.

### **4.3 Individual differences and characteristic types of surgeon**

I anticipated that I would see individual surgeon differences in attitudes and beliefs towards EBM across and within the three sites. I assumed that this would be due to their personal characteristics, how they were trained and when they were introduced to the concept of EBM. The research process of EBM removes the context from practice. It aims to find a causal relationship between two variables which can be altered systematically and independently of context to produce the optimal evidence-based outcome (Gray, 2009). In contrast, the real world practice I observed demonstrated the vital importance of context, individual discretion and autonomy.

Decisions were often made through a variety of factors, including but not limited to: learning from one-off experiences, patterns of practice observed over time, formal and informal training, social and organisational processes surrounding the individuals, and the wider cultural and historic forces at play. Together, these factors interact and could be associated with distinct characteristic types

which developed amongst orthopaedic surgeons. I recognised that the personality traits of surgeons are likely to be fundamental to their use of evidence and interpretation of knowledge. However, I did not set out to explore this level of detail in my study. Instead, I was interested in characteristic types of surgeon in relation to the evidence.

The majority of data presented in this chapter came from interviews with surgeons about their work. However, some data originates from other respondents' opinions about orthopaedic surgeons as a particular type of clinician. These views were important to allow me to corroborate or challenge my emerging findings and to understand what it was like for others to work with surgeons day-to-day. During the interviews, I asked each surgeon to describe in detail how they decided which surgical procedures and implants they selected for treating arthritis of the hip, and why this was the case. This helped me to determine what type of knowledge they privileged during these decisions and to understand their individual characteristics. This was not an easy task for some of the surgeons. They struggled to explicitly state the tacit 'how' and 'why' reasons behind their choice of certain treatments. To adapt Polanyi's (2012) phrase they '*knew more than they could tell*'. The two quotes below demonstrate the importance of 'just knowing' and personal familiarity in decision-making:

*"You just know, I think, you just know when somebody who really needs it comes in, it's obvious. I think I also just know when somebody absolutely doesn't need it. That's a hard one particularly if they're coming expecting something. And then there's definitely a grey area where, you don't know ... I tend to come down to what I judge is right." (INT C 37077)*

For others, this question was responded to rather mechanically as a series of steps that would be taken to achieve their goal. They would describe their general approach as a story; first I do this, then I do this, then this in a matter of fact fashion. For most of these surgeons, the story started with the patient consultation and ended with the operative event. They would provide details of their methods including how they selected patients and their decision-making around the choice of implant and technique. An example of this narrative is provided below:

*"I would say that the way we decide about a patient and whether it is appropriate to offer them a joint replacement is to first of all obviously get a feel for the level of the symptoms they have and how much they interfere with their pain function and quality of life and then the next questions to ask are, are they fit enough for the surgery at the moment, are there any barriers to proceeding straightaway, and if there are barriers, are they modifiable or are they fixed? Fixed in respect of whether they would prevent a patient proceeding and then once those boxes are ticked, I guess the next question is to decide what sort of prosthesis might be appropriate and that really I operate within a fairly limited framework of prostheses." (INT C 190004)*

Very rarely was a consideration of the best available evidence reported as the reason why a surgical procedure or implant was selected. The hierarchy of evidence did not appear salient or useful in these decisions. In the quote below, a consultant surgeon describes how he categorises the evidence and privileges experience and expert consensus:

*"Typically it falls into a few categories; it can be sort of local evidence so it might be experience of surgeons in our unit who have done that type of thing before or, your own experience of having done so many types of procedure and what your results might be in your, in your practice. Sometimes it involves knowledge of recent published papers in that area and that is either case series or rarely sometimes randomised clinical trials. But that's ... generally you feel confident doing that because you know that that's supported by consensus amongst experts." (INT C 218011)*

In addition to the interview data, I observed and shadowed surgeons going about their daily work. This helped me to understand the typical language each surgeon used and how they tended to make decisions. I specifically looked for examples where the surgeon would draw upon a source of evidence and knowledge to make decisions in real time. This helped to illustrate and describe the practice variation across the distinct groups. I will describe three empirically-derived characteristic types which emerged from the data collection and analysis. I have called these Innovators, Mavericks and Gold-Standard surgeons.

#### **4.3.1 Empirically derived surgeon characteristic types**

During interviews, the surgeons and associated staff would talk about themselves, other groups of surgeons and hypothetical types of surgeon as

conforming to particular stereotypes. The language of the participants to label these characteristic types has been directly used for the categorisation in this section. Individuals did not always act consistently with their characteristic type. As would be expected, individuals could and would change their typical behaviour and decision-making practice in relation to contextual contingencies. In this sense, the types provide summaries of the typical clusters of behaviours which I observed during my empirical work, and not fixed states.

#### **4.3.2 Characteristic types: Innovators**

An innovator surgeon was characterised by their desire to want to try new implants and techniques in a quest to improve the orthopaedic field. This visionary approach appeared somewhat naïve and possibly over-optimistic. These surgeons really believed that they were making a difference to patients having orthopaedic surgery. The surgeon below describes their positive stance on innovation in their work:

*“When I started doing it, I started testing it on a few patients of my own and when it seemed to be working and I’d got it to a point where it was now becoming useful, I then approached my three or four key colleagues who do most of the hip replacements and said, look, this is what I’ve done and what do you think and showed them how it worked.” (INT C 218007)*

The key driver for these surgeons was a desire to move the technology forward in search of the “perfect hip” (INT C 218007). There was also an aspiration for personal and career development. These types of surgeon did not appear to act in a non-evidence-based way intentionally. Instead, innovators saw themselves as the “engineers of orthopaedic surgery” (INT C 198005). The quote below demonstrates the confidence this surgeon has in the improvement that he could make:

*“Yes, so I came up with an idea for a new kind of wrist splint to treat patients who have got a wrist fracture. I was very clear in my own head that this was a definite innovation, it would definitely potentially make a difference. They just didn’t get it. It’s like ... they didn’t seem to fathom the concept of it, despite me explaining it and sending them pictures and 3D drawings, they just didn’t get it. It wasn’t something I could manufacture myself on my kitchen table, like I did with the other*

one.” (INT C 218007)

I observed one surgeon giving a seminar on innovative practice during my period of data collection. I had attended this seminar regularly during my fieldwork at this hospital. The audience were used to standard academic research presentations, but this talk was met with applause and congratulations for his achievements. These were a summary my thoughts following his presentation:

*“He gave a strong message to the audience regarding the importance of innovation and change for surgery so that “we can move the specialty forward, and not stagnate”. He showed pictures of him working on his prototypes and then bringing them into the hospital to try them out on patients. This talk was exciting for the audience, there was a buzz in the room which was unusual.” (OBS notes site A)*

Not all the orthopaedic surgeons I interviewed, however, viewed innovators in a favourable light. The quote below gives an example of the negative connotations others associated with uncontrolled innovation:

*“I don’t think you can convince these people that they’re taking massive risks with people’s quality of life because they’re innovators, they’re there to make things better. They have an unshaken belief, you know, it’s a bit like a personality disorder, I think. A true innovator must have some degree of variance from a normal personality traits.”(INT C 190004)*

These negative views appeared to stem from a belief that innovators were attempting to improve practice within the context of their clinical work, not in the context of large clinical trials, and changes to techniques and implants could not be scaled up in the same way as RCTs. Innovators did not privilege clinical evidence over their practical, experience based learning. This appeared to represent some danger to colleagues who practised EBM. The quote below reflects these problems:

*“Yes going back to what you were saying about innovation, so within that yes you might find small sub groups of patients where you want to push the envelope a little bit with one technique or another. But that should not be being done by a lone surgeon in a lone department somewhere with no research support and no ability to follow up the results, no actual research question that they are*

*asking in the first place they are just tinkering and trying a few things.” (INT C 218009)*

There was an apparent divide between those surgeons who saw innovation of any type to be beneficial for their specialty and those who did not. The surgeons who did not innovate tended to believe that innovation should be confined to R&D facilities, clinical studies and RCTs.

#### **4.3.3 Characteristic types: Mavericks**

Mavericks possessed what some consider to be the stereotypical traits associated with orthopaedic surgeons. This type of surgeon was the ‘showman’ of their field and had an unbounded confidence in their surgical ability. The maverick type is a hypothetical type described and inferred by other surgeons and surgical staff. Unlike innovators, mavericks did not describe themselves directly as ‘mavericks’. However, others would label surgeons mavericks. Surgeons who aligned to this type would describe themselves positively as a “rebel” or the “trouble-maker” in the department (*OBS notes Hip Conference 2016*). They seemed to know that the way they acted, the autonomy they possessed, and the discretion they held over decisions, went against the norms of their hospital and community. The quote below regarding the use of surgical drains demonstrates this point:

*“So I got told three years ago I can’t use drains for my replacements, okay? Which I found repugnant, because I was told by somebody who isn’t a surgeon, I can’t use a drain. I think that is awful because you’re undermining the surgeon who’s trying to do the operation. They argue they make no difference, well, you know, you can look at the difference in my patients... You know, but I always get told I can’t do these things (laughs).” (INT C 37010)*

During an observation session a nurse working closely with a maverick surgeon referred to him as “*thinking he was god*” because of his inherent belief in his own skills and ways of working (*INT C 218005*). The mavericks were reluctant to relinquish control over their decisions and actions. There were consequences for surgical teams when a maverick surgeon did not get their way, for example mavericks might display their anger by throwing instruments and raising voices. One surgeon refers to a group of specialists he works with as “*absolute*

*mavericks*” in the quote below and demonstrates how they are able to “*get away with (it)*”:

*“You think they are bad here?...[Hospital name] is the Wild West of orthopaedics. You think you’ve got a problem meeting some orthopaedic surgeons, you wait and see some revision surgeons, absolute mavericks, some of them. Really fascinating ... implants that are far more expensive than standard hips and knees. Nowhere near. People are too frightened of those surgeons.” (INT C 377011)*

Maverick surgeons had a tendency to be the trendsetters in their hospital or their field. A common theme amongst the maverick surgeons was that they were more inclined to favour the “*shiny new kit*” over the industry standard supplies (INT C 119014). There seemed to be little negative consequence in ordering an expensive next generation implant versus a cheaper generic implant. This was described by surgeons working at all sites, and evidenced below with quotes from two surgeons at site B:

*“So I know some surgeons who are mavericks, who see a shiny new piece of kit and go, oh, I like that, I will have that, and I will use this. I’m going to use that and implant it and see how they go. Right?” (INT C 37010)*

Unlike the innovators who were driven by technical improvement and a desire to develop and test implants in practice, the mavericks appeared to want to use what they personally determined to be the new best piece of equipment or technique. It was not clear what was ‘best’ as it seemed to be a personal interpretation, and the driver behind the decisions was not evident through my observations.

Interestingly, when I listened to surgeons speak at conferences, some would be individually sponsored by manufacturing companies to promote a product. The entire presentation appeared to be an advertisement for a new implant or piece of equipment. These surgeons did not report the results of trials through research council funding or report their affiliation to university departments. There was a sense of competition between maverick types as to who could

*“shout the loudest”* at conferences (*OBS notes Hip Conference 2016*). These individuals would make a concerted effort to have their opinion and voice heard in discussions and presentations by colleagues.

#### **4.3.4 Characteristic types: Gold-Standard surgeons**

The gold-standard surgeons took a production line approach to practice. In this sense, these surgeons would characteristically perform the same types of surgery using established prostheses repeatedly, because to them these procedures were effective and proven. A number of surgeons I interviewed described their hip replacement practice as *“run of the mill”* (*INT C 218008*) or a *“production line”* (*INT C 190004*). These surgeons seemed to know what their typical practice should be, and the outcomes they could routinely achieve for their patients by selecting evidence-based standard implants. Gold-standard surgeons appeared to have little motivation to change practice unless they were given a valid and evidence-based reason to do so. The quote below reveals this desire to follow the established practice:

*“Well orthopaedics is fortunate in that we have got quite a few operations that work well with large treatment effects. So you don’t need to tinker too much with it because the treatment effects are so large that the patients are going to do very well. So yes just deliver the service as simply and safely and as reproductively as you can which is where following protocols is best.”* (*INT C 218009*)

In my study, gold-standard surgeons represent two elements of standard practice. One group aligned to the standardisation which emanates from closely following the clinical evidence base and standards for implant selection established by organisations such as ODEP and NICE. The second group had developed a standardisation in their practice from a lifetime of performing the same surgery. These elements are represented in the quote below:

*“I operate within a fairly limited framework of prostheses, all of which are ODEP 10A rated. I don’t do any experimental procedures on patients at all, and the choice of prosthesis I think would come down to really essentially the same prosthesis but minor variations in the bearing surface. So for example, at the moment I have for hip replacement all patients receive some variant of a (brand). In the over 70s, it’s a metal on plastic bearing. If you’re between 60 and 70, it’s a ceramic femoral head, and if you’re under 60, the emphasis is more towards a ceramic on ceramic bearing. I think the evidence base for the latter two is fairly strong. The evidence base for the under 60s is probably not*



*as strong as it could be.” (INT C 190004)*

The theatre nurse who coined the term “*gold-standard surgeon*” in my research was describing a surgeon with whom he had worked for nearly twenty years, whose practice was so predictable that the theatre nurse could “*set his watch by him*” (INT C 218013).

It appeared that two different types of evidence were important for the gold-standard surgeons. First, their personal experience that an intervention is effective, and secondly that clinical evidence in academic literature suggests certain options are preferable when compared to others. In both of these, there was a focus on attaining proof over long periods of time. These surgeons were reluctant to change their practice overnight to match the trends of innovative or maverick colleagues. The surgeon below reflects on the long term negative consequences of changing practice:

*“I don’t think it’s helpful or innovative for me as a surgeon to be trying something new on my own in the hospital, whereas lots of surgeons would genuinely believe that but they, I don’t think they fully understand what they’re doing or the implications of what they’re doing and that’s because they are not, they’re not research trained to understand like that, they’re trained surgeons, they know how to put the implants in but they may not really fully understand the implications of what they’re doing and that’s the issue. So on a very personal level they feel that they’re doing something useful for them and the patients but actually probably something really rather unhelpful for everyone.”(INT C 218011)*

#### **4.3.4.1 The use of metaphor to describe the characteristic types**

The surgeon types represent characteristics types of behaviour and decision-making processes that appeared to be dependent on the evidence each characteristic type deemed important. For the innovators, seeing something new work first hand was key. The mavericks needed to have the latest products for their practice. The gold-standard surgeons would perform what the clinical evidence and surgical tradition suggested was best.

Throughout the interview process, the surgeons repeatedly used metaphors to describe their practice and the characteristics and stereotypes of their

colleagues. One particular metaphor is linked to cars and vehicle manufacturing. For example, a gold-standard surgeon compared the use of traditional metal-on-polyethylene hip replacements to the Ford Model T car. The production of this car is renowned for its standardised processes, and focus on effective replication. He was suggesting that a similar approach should be used for hip replacements in the NHS. He also compared the technologically advanced and more expensive hip replacements to a Rolls Royce, and argues against their selection in the quote below:

*"I don't think the NHS was ever built to give every patient a Rolls Royce implant. And I think there's too many Rolls Royces being put in ... it's unnecessary. They could have the Ford Model T, they could have a metal and plastic. I think a huge number could have been metal and plastic." (INT C 37011)*

The surgeon below describes the innovation between new types of hip implant by comparing it to small differences in the performance between two types of supercar. He suggests that hip replacement surgery is well-established, and therefore only small improvements can be made through innovation:

*"The innovation...[of different hip replacement types] has got to a point, really, where you're tinkering between the performance between a Maserati versus a Ferrari in terms of your particular performance domain, you know, you've got to be really confident that you know what you're doing to mess with that." (INT C 190004)*

When reflecting on the maverick behaviour amongst himself and his colleagues, the surgeon quoted below suggests that "*most people*" want the latest and greatest car, not the unrefined Beetle. This was a metaphor for the next generation implants compared to the established and reliable prostheses:

*"It's like when you go to buy a car. Do you say I want the latest and greatest car with all the features on it or do I want a VW Beetle from 1970s because they never broke down. Some people like the idea of a car that just never breaks down. It's not the most refined thing, but it does the job. Then obviously most surgeons probably think well I want to go for the latest thing. I just think we've got to always have an eye on the next generation. Otherwise we'll never get beyond ... essentially we'll live with the obsolete. We'll be driving around in Volkswagen Beetles forever." (INT C 218007)*

The important feature of these surgeon characteristic types is that the variation in individuals and their typical behaviour may lead to variation in the practice of hip replacement across sites, and across the country. The characteristic surgeon types were associated with the preferences of surgeons in relation to their autonomy and the discretion they enacted over decisions. These preferences varied and differences were enacted in practice. I observed representative examples of each type of surgeon at each case study site. The only seemingly majority group was at site A, where the surgeons tended towards the gold-standard type. I believe that this was linked to their focus on academic research and EBM. However, I also observed maverick and innovator types in site A. In practice, patients scheduled for hip surgery would not know which type of surgeon would be operating on them. This variability amongst surgeons and their choices might be a legitimate source of concern, if decisions regarding the type of procedure and/or the implants selected were driven by the characteristics of the individual treating them, not by the evidence-base.

#### **4.4 Autonomy, discretion and decisive decision-making**

One distinguishing trait consistent across all these surgeon types was the autonomy, discretion and decisiveness that each surgeon held over their decision-making and practice. This was a function of their role and identity as an orthopaedic surgeon, not the result of their characteristic type. I propose that autonomy and decisiveness are associated with their elite professional status within hospitals. The short quotes below demonstrate the autonomy, discretion and decisive decision-making that were the norm across all three sites:

*"I'm confident that what we do is the right thing to do." (INT C 198003)*

*"I am confident about the decision. It might not be the right decision. There is an old adage about Trauma and Orthopaedic Surgeons that "they are often wrong, but they are never in doubt!" (INT C 218008)*

*"Whereas a physician might sit back and go and think about a problem in the sort of coffee room there and deliberate, our job isn't like that. You know, it's sort of immediacy, you need to have an immediate decision. And you have to recognise that some of your immediate decisions are often incorrect and accommodate to that." (INT C 37011)*

Orthopaedic surgeons are a professional elite with a prestigious occupation within the medical profession. Their decisive sense of discretion and ownership over their decisions was aimed particularly towards the individuals outside their elite, such as managers, researchers and policy-makers. Surgeons who are not autonomous and decisive might look and feel out of place in their working environment. The quote below shows how these surgeons believed that colleagues and patients would lose confidence in them and their skills if they showed indecisiveness:

*“There’s a sense that you sort of have to make decisions and you become very sort of quick to make decisions. “Okay let’s do this and we stick to it” because as you can imagine uncertainty for patients is quite difficult to comprehend, “Oh bloody hell I’m not having an operation with that person” and so you ... and I think for whatever reason patients, well patients don’t like uncertainty and if you show that to patients they lose confidence.” (INT C 218011)*

#### **4.4.1 Tactics surgeons used to change the evidence through resistance, power and enactment of their views**

The characteristic types of surgeons functioned in parallel to the contingencies of the groups, the constraints of the organisation and wider regulatory forces which I describe in the other three results chapters. Together these elements enabled me to understand the nature of orthopaedic surgical work and the knowledge mobilisation that occurred in context. It has allowed me to describe what happened in the real world, and to capture a sense of an understanding of the play of chance and uncertainty in clinical practice. I was able to examine the dependency that existed in practice, i.e., that decision-making was conditional on other factors such as the availability of a chosen implant. The characteristic types of surgeons interacted with contingent factors of context in three key ways. I have identified these as resistance, power and enactment. The findings also revealed that surgeons used their behaviour as a tactic to change or manipulate the evidence towards their own preferences.

##### **4.4.1.1 Resistance: beliefs about evidence and NICE for informing practice**

During my study, everyone I interviewed uniformly believed that a hip replacement was a good thing to do given the right circumstances. It is a highly effective treatment, which produces significant improvement in patients’ quality

of life and symptoms post-surgery. The surgeon below describes the benefits of THR:

*"Now, I'm a hip surgeon so I'm a bit biased. But hip placements are amazing, you know, and they only maybe get beaten by maybe heart surgery and having your cataracts done, okay. So if you're going to spend your tax pound, you don't spend it on bunions, you spend it on hip replacements as they are amazing. If you look at your quality of adjusted life, your quality goes bosh, it goes straight up after those, right."(INT C 37010)*

This positive treatment effect is the message outlined in the clinical guideline produced and disseminated by NICE. Hence the original guidance, and the subsequent update were seen by many surgeons as common sense and therefore unnecessary and of little benefit in practice. These assumptions were made on the premise that surgeons already possessed the knowledge. The quotes below illustrate the strong negative beliefs surgeons held about NICE guidance:

*"NICE, is irrelevant. They don't tell me anything. Well, it's just that, you know ... which orthopaedic surgeons sit on that panel...? None, no I don't see that as hugely applicable to my everyday practice particularly if it was divergent with the BOA (British Orthopaedic Association) guidance." (INT C 37011)*

*"I think the drivers they're striving for are ones that I would entirely espouse and everything. But they have broad brushstrokes, because they haven't said that much about joint prostheses and they didn't even come out, you know when the hip resurfacing implants were first developed. This was an experimental procedure in the same way that they would do about drugs, you know, so they should have been more on the ball then, so that's a weakness of NICE. NICE are not being proactive enough, I would say, in terms of making recommendations on prostheses and they could do a lot more to stop the maverick innovation." (INT C 190004)*

However, despite the common knowledge that hip replacements work, there seemed to be little consensus about the treatments that exist and which are most appropriate in what circumstance. In 2000 NICE published its first clinical practice guidance on hip replacement (TA 2) informed by scientific evidence on surgical treatments. In February 2014, NICE released the latest update (TA 304). I was therefore able to assess how this particular guidance influenced orthopaedic surgical practice in real time, since my data collection started in

December 2014. Hospitals have three months from the date of release of guidance to ensure that NICE Technology Appraisal (TA) recommendations are met:

*"The NHS is legally obliged to fund and resource medicines and treatments recommended by NICE's technology appraisals. When NICE recommends a treatment 'as an option', the NHS must make sure it is available within 3 months of its date of publication." (Doc analysing NICE TA guidance)*

Surgeons considered that NICE guidance was out of date or irrelevant and this was mentioned as soon as I broached the topic with them. This point is shown in the statement below:

*"The other thing with NICE guidance is it's never get reviewed, does it? So you can have NICE guidance that's about ten years old, fifteen years old, with long, long gaps between reviews." (INT C 37003)*

There was a lack of awareness about the NICE update amongst staff responsible for managing the orthopaedic departments. Conversations with managers revealed that they were unaware that the guidance had been updated in 2014. The lack of awareness was bolstered by a lack of trust and appreciation of NICE as an organisation and of the clinical guidance it produced. These elements together created resistance to the evidence being used in practice. I observed this trend from the junior surgeons in training, right through to board members responsible for running hospitals. The quotes below demonstrate how this resistance plays out across the hospital hierarchy:

Hospital board member:

*"I mean, a candid opinion from me is I think NICE guidance is very much just seen as another layer of administration for clinicians until it becomes relevant in a clinical sense. I think in the general sense if no one's looking at whether you're following NICE guidance or not. They will just sit on a shelf, unless you have a very active team of clinicians who take this on board. But that's not a consistent thing, it... And I'm talking not just here but across my experience in other big Trusts." (INT C 37003)*

Consultant surgeon:

*"First of all I think when NICE first came out, I thought its aims were very laudable. I think it became quite political quite quickly, which was probably inevitable. But I think NICE probably does have some limitations. So, but I, so I think NICE in itself is far too over complicated. So I think it's really over complicated as an organisation, personal opinion, and I think it's complicated for even doing things which we'd class as relatively straight forward. I think they've almost been given too much of a mandate. They've been told to do too much. So I don't know how focused they are, to be honest."*  
(INT C 37010)

Trainee surgeon reflecting on the attitudes of their seniors:

*"I'm not quite so convinced that doctors are convinced by evidence they'll look up something and if it happens to coincide with what they want they'll quote it."* (INT C 198001)

The only site to show a distinctly different trend in their trust and appreciation of clinical guidance was site A. I consider that this may be due to their focus on research and academic output and beliefs regarding the importance of NICE and the EBM approach. A quote from a surgeon working at site A illustrates this:

*"So there are some very common conditions that we see and I am mainly based around the hip now where we do try as much as possible to follow the basis of evidence which is...So the types of typical patient would be one with where we would need to use evidence. There is not much of a dilemma about someone with end stage osteoarthritis as the guidance shows the pathway that they should take, so joint replacement is the way to go."* (INT C 218009)

The few academic surgeons employed at site C (the large teaching hospital) demonstrated significant variation in their individual beliefs regarding NICE. Those that were located full-time at the University site tended towards more positive opinions of NICE guidance and clinical evidence when compared to those located full-time at the hospital. Interestingly, all four individuals in this role held the academic title of Professor. This suggests that the physical location of a surgeon could have an important influence on their beliefs and usual practice.

Nevertheless, a common thread throughout the data collection was that clinical evidence and guidelines could, and sometimes should, be resisted by the surgeons in practice. The hierarchy of evidence promoted by leading orthopaedic journals seemed to be largely irrelevant, and sometimes inverted in

practice. The quote below reflects individual beliefs about the lack of usefulness and appropriateness of evidence and NICE guidance for day-to-day work:

*"There is very little sort of robust evidence to guide practice so you rely on other peoples' anecdotal experience and normal practice to help guide what, what works and what doesn't and so if you're perceived as doing something that most surgeons wouldn't do then you would be worried that you're doing something either ... well either you're doing it on purpose to be a maverick or you're doing something which you shouldn't be doing." (INT C 218016)*

This section highlights how resistance to EBM and NICE guidance were widespread.

#### **4.4.1.2 Power: retaining power over evidence and decisions and the belief that orthopaedics is different**

One key notion that arose consistently during the data collection was that orthopaedics is 'different', and therefore orthopaedic surgeons are 'different'. The element of difference was variable and seemed to be applied to many parts of clinical practice, such as the requirement and appropriateness of guidelines, conducting surgery and having to conform to organisational rules. Being 'different' appeared to allow the surgeons to retain power over their decisions and actions, and to reject EBM, as illustrated below:

*"There were still people who don't follow sort of policy evidence based guidance. I think it's orthopaedic tradition that, I think it's just more characteristic of orthopaedic surgeons." (INT C 218011)*

The 'difference' argument used by surgeons fell into two general categories. The first was identifying problems with the evidence base, particularly the appropriateness of RCT data for orthopaedics. Surgeons would suggest that trial evidence was lacking, or that it was low quality or conducted on inappropriate patient groups, as demonstrated below:

*"99% of what we do though in orthopaedics is evidence free, most of what we do, is we do what we do and you can't really provide any evidence basis for it you know it's what's been done and apparently works and seems to work." (INT C 218011)*



Within the specialty, the historical lack of RCTs has been linked to the reluctance of surgeons to participate in trials. This was not the case for surgeons in site A, but more so in case B and C where the majority did not conduct or participate in trial data collection. When asked why this was the case, they suggested that clinical equipoise was absent (e.g., if one treatment is already known to be preferable, it should be offered and not denied to trial participants by randomisation to an inferior treatment) or because of logistical constraints or organisational restrictions. A surgeon at site B commented that *“we are not set up here to do trials”* (INT C 37011). The surgeons who did align to EBM traditions were seen as outsiders. Surgeons at sites B and C suggested that clinicians who participate in trials are often fanatics or innovators, located in Universities and therefore *“not your normal surgeons”* (INT C 119003):

*“Me basically, I suppose it’s research attached to clinical work, rather than you know, my colleague here who just is in university and he’s more of a rat doctor. Yes. Doing good work but doing what I call a real sort of scientist rather than we’re just sort of teaching consultants.”* (INT C 198003)

The second issue was with the type of evidence that the surgeons were expected to use. EBM evidence often fails to take into account the human element of surgical practice and lacks a consideration of the clinicians’ mindlines. The key phrases that the surgeons used to summarise this notion was that orthopaedic surgery is an *“art”* or a *“craft”* and therefore not a science which can be guided by scientific evidence. In essence, knowledge originating from EBM was not fit for purpose because it could not account for the implicit knowledge or beliefs of the surgeons. The surgeon below describes his decision-making process as a faith:

*“So your craft and experience will shape the way you believe something should be done. But there’s almost an element of faith about it. It’s like we’re all Christians, but there’s some Catholics and there’s some Protestants. We all know basically where it needs to be. But there will be those of us who feel strongly, actually I want to do it this way and others I want to do it that way. Nobody knows which is right.”* (INT C 218007)

The limits of the evidence base enabled surgeons to retain a sense of power over their decision-making. Unlike art and craft skills, scientific evidence assumes that treatments and interventions have predictable effects, i.e., that intervention

A can predict the occurrence of outcome B in all patients. However, as suggested earlier, the surgeons in my study did not automatically translate knowledge from RCTs to the patients in front of them. Instead, experience, patient symptoms and their training appeared to take precedence. This process of bringing together different types of 'evidence' to make a clinical decision could not be planned rationally, and therefore represented a type of craft work. A definition of craft work in healthcare is provided below for clarity:

*"Medical craftsmanship, characterised by the relationship between the craftsman, the material and the tools, constitutes a professional ability to encounter complex tasks requiring individual choices and judgements." (Malterud, 1995)*

However, this belief in the art and craft of practice was not the view held by all the surgeons I interviewed. Some maintained that this was a myth that is used to justify particular behaviours:

*"I don't think there's much art. I don't think there's much artistry involved, it's based on evidence and if you get, if you get some reasonably respected people to look at that evidence and develop policy that's reasonable and respected then that's really useful to people." (INT C 218010)*

It is true that orthopaedic surgery cannot be directly compared to many other interventions in medicine, such as taking prescription medication. Often medication which has been approved by NICE has been refined and is proven to have comparable outcomes. In surgery, each procedure introduces an element of variability as the people and situation cannot be controlled and predicted in the same way. Therefore, surgery requires some form of real time judgement according to individual patients and surgeons. In my study, this judgement as applied to the patient in the consultation, appeared not to originate from the codified technical knowledge of scientific evidence, but from experience learned over years in practice (mindlines). This vague and non-codified individual knowledge seemed to exist alongside technical knowledge of clinical science. Knowing what to do was referred to as "*instinct*" or the "*gut feeling*" that guided practice. This innate belief is described in the quote below:

*"Instinctive reactions can vary in different operations; sometimes things work and sometimes they don't. You don't know until you are 'in' there." (INT C 198005)*

As well as the knowledge the surgeons held in their heads, they reported that they had to respond to the current situation in their hands. The 'feel' of the surgery, and the intrinsic perception of whether it was right or wrong was influential to decision-making, particularly during the operation. The use of the phrase "*in my hands*" was quite common amongst the surgeons when asked to describe what they do and why. As described here as the surgeon explains why he selects a certain implant:

*"Well that might be the case but I haven't been trained to use this type of implant or device and in my hands that wouldn't be a good choice and therefore I should use this because this is the thing I've always put in and me changing practice might actually be more harmful or dangerous than sticking to what I know." (INT C 218011)*

In my study, this gut feeling could be used to justify almost any decision. The process was difficult to understand, monitor or change by those hospital managers on the outside, because they did not possess the correct knowledge and skills to allow them to make a judgement. Maintaining a sense of difference therefore, could be seen as a way that the surgeons retained power over their decision-making processes.

When examining the data, it is difficult to determine whether there is a real difference between the practice of orthopaedic surgeons and those in other clinical specialties who work with similar patients, such as nurses and physiotherapists. The fact the surgeons were responsible for actually performing an operation on patients was an obvious distinguishing feature. The work was literally 'in their hands'. It seemed as though this inherent responsibility for the life of the patient and their outcomes resulted in a drive to trust and privilege *implicit* types of knowledge, over and above those promoted through EBM. These other sources of knowledge were directly linked to the individual surgeon, such as their practical experience and education. Therefore, this allowed variation in knowledge used for decision-making to be observed.

This section has described the power that surgeons exert in their day-to-day practice in relation to EBM, other professionals and their patients. I have described the way in which concepts of the 'difference' of orthopaedic surgery and the 'art and craft' of orthopaedic surgery play into the power surgeons are able to exert.

#### **4.4.1.3 Enactment: experiential knowledge and surgical education**

My findings suggest that the most influential factors in decision-making at the level of the individual surgeon were their personal experience, their experiential knowledge and their training and formal education. Training and experience were mentioned in all of the interviews when asked why each surgeon made a decision in practice. This finding could have been anticipated prior to my data collection, but what was surprising was the level of influence it held for surgeons, as echoed in the quote below:

*"I think the key is what you've been brought up with it. If it worked for your boss you tend to do what he did. Okay, with time things have changed. I think you see what's out there, who uses it and what's got a decent track record." (INT C 198003)*

Common responses throughout the data collection included statements such as: *"that is what my consultant taught me", "it's worked for me before"* and *"that's what I've always done"*. Often there was no other justification provided or believed necessary. These learned behaviours and long-standing decision-making processes seemed to be the first port of call for the surgeons. They did not appear to consider this type of knowledge as an evidence source, as to them it was the normal and innate way of thinking, acting and behaving. The surgeon below describes the enactment of this type of knowledge:

*"Well there's the theory of it and then there's the practice of it. So the theory is well-established, it's in the textbooks, it's in medical papers. That's something you learn as you go through the training, this is where things ought to be. But then obviously there's the practical aspects of doing a joint replacement. So you would learn that as a student mentor thing with your consultant and you'd talk through where you were going to put the hip socket in this particular operation. You'd watch where the boss puts it and you might do one and he'd say yes, that looks about right and you'd look at the X-rays and agree together, was it about right? So there's that combination of learning methods if*

*you like. Then obviously as you become a consultant you're then doing it, then you learn from your own experience, you learn from your own complications." (INT C 218007)*

In the UK, orthopaedic surgeons generally follow the same training pathway starting in medical school followed by foundation doctor rotations and specialty training before reaching consultant status. Therefore, we would expect little variation in the practice of junior doctors as the regulators responsible for training closely control their work and curriculum. It is not until later on, when surgeons are able to work closely, often one-on-one, with a senior consultant in an apprentice-style role. This type of training may allow for differences in practice and techniques to emerge. The learning that takes place in practice seemed to be very important to surgeons when developing their experiential knowledge. It is during this time that the surgeons said they were able to *"try things out for themselves"* (INT C 218009). This combination of experience and training appeared to stay with the surgeons and influenced their practice until they reached consultant level and beyond. A junior surgeon and a mentor describe the importance of gaining a variety of experience during surgical training:

Junior:

*"All three of the consultants do different things, and you learn different things from all of them." (INT C 198001)*

Mentor:

*"Yes, so when our trainee comes he just sees me using these implants, and I say to is, when you're training you want to see as many different implants as possible, there might be certain things about implanter technique or something that you like, and you also learn what you don't like, don't you really. Yes, so training is really important." (INT 198005)*

The consultant below reflected on the transition from instrumental to experiential learning once they were appointed as a consultant:

*"I thought I was trained well. But then I was on a really good programme, (name's) training programme is excellent, fantastic really. So training-wise I haven't changed. I don't know, you truly sort of learn when you are appointed as a consultant actually. I think you've just got to work it out*

*for yourself then.” (INT C 37011)*

Surgical practice was not fixed for an entire career and many surgeons were undergoing additional training to amend their work during the period of data collection. However, certain changes were difficult to implement if they appeared to have originated from outside the individual surgeon or colleague group. In site A, the entire clinical group had adopted standardised protocols for performing arthroplasty (joint reconstruction). This had been part of an improvement process to reorganise the patient pathway. One nurse mentioned the problems she faced when challenging the normal routines of the surgeons, despite a strong evidence base to do so:

*“It caused a lot of stress here. But my sense is that probably the more, the bigger a department is, the less flexible a department can be for lots of different types of device or technique or whatever. Things have to be standardised or that becomes a bit unworkable.” (INT C 218004)*

The training and experiential knowledge of surgeons was found to be a limiting factor in their practice. They suggested that the range of procedures they used was restricted by their particular specialty. For example, surgeons who saw themselves as hip surgeons were reluctant to perform a knee arthroplasty and increasing sub-specialisation at the complex end of the spectrum meant that experience was less well-maintained at the lower technical end of hip arthroplasty work. The quote below shows how specialist surgeons differentiate their work from ‘standard’ hip surgeons:

*“I think the advantage for us is that all the guys here were just purely specialist hip surgeons, whereas in the periphery the guys have to do a bit more standard work – so they’re appointing guys more with the specialist interest here.” (INT C 198003)*

This led to some clear demarcation between the different sub specialties, for example surgeons made reference to being a hip surgeon or a specialist hip revision surgeon. This was particularly the case in site C where they had a ‘super elite’ group of surgeons who were referred specialist patient revision cases from elsewhere in the region. Observations of these super elites revealed their

negative attitude toward the more generalist hip surgeons, who they identified as “boring hip guys” “on the treadmill...making money and having an easy life” (OBS notes general site C). I observed these informal professional boundaries elsewhere. For instance, I attended a multinational conference and there was an obvious difference between surgeons trained in different locations. The excerpt from my field notes summarises my thoughts on the use of experiential knowledge and education, and how this coupled with location enabled surgeons to refer to themselves by their surgical technique:

*“The message from the USA surgeons seems to be that they can’t or won’t perform cemented hip replacements. One presenter said that he had “lost [the] skill” and then over time within the hospital certain techniques “just become phased out”. These surgeons were not only limiting themselves by specialty, i.e., hip surgeons, but also by the specific technique, i.e., cementless hip surgeons.” (OBS notes. Hip International 2104)*

The variation that results from experiential knowledge is slightly more complex to examine than knowledge gained from formal training or the routine hospital processes. It refers to contingencies that could arise from the enactment of socialisation, lived experiences, innate responses to events and the ability and skills each surgeon brings to his or her practice. The decision-making and the selection of evidence seemed to be conditional on the surgeon, and therefore on their character and disposition.

A possible driver of variation in training and learning process is the fact that no classification system or criteria exist for hip replacement surgeons to abide by. There are no sets of rules for what constitutes an ideal hip replacement, only recommendations which include various techniques and implant options. For a group of individuals who tend towards decisiveness and autonomous behaviour, it may be difficult to introduce a set of rules as it would be challenging to inform surgeons that their years of education and experience were incorrect or misinformed, and should be changed.

In this section I have described the enactment of experience and surgical training to highlight the strength that these types of knowledge hold over decision-

making practice for orthopaedic surgeons in my study.

## **4.5 Individual contingencies of surgical practice**

In the second half of this chapter, I describe the contingencies of surgical work that were important and influential to practice at the individual level of analysis. I will also discuss the variation in practice that I observed between the individuals and what the surgeons thought of this variation.

### **4.5.1 What influenced the decision to operate?**

Within orthopaedic surgery, the surgical operation itself was the key decision event for the surgeons. The actions and practices of a particular operation, or the general approach to hip surgery is what they mostly described when I asked them to detail their practice and decision-making. However, orthopaedic practice is more than the act of orthopaedic surgery. I observed a great deal of clinical and non-clinical activity which took place before and after the operative event, in addition to all the managerial and administrative elements of daily work. Despite this being important work for the delivery of arthroplasty services, it did not appear to be held in high esteem by the surgeons. Their focus during the interviews was generally on the act of surgery.

Across the three cases, the surgeons typically encountered patients at an outpatient clinic who had referred from their General Practitioner (GP). Case B differed slightly, as they had an intermediate triage service stage. The patients met with the consultant surgeon or specialist registrar in a general arthroplasty clinic, where the surgeons would consult on a variety of patients at different stages of treatment. The aim of this meeting seemed to be understanding the patients' problems and finding out if they were "*for surgery*" or not (*OBS notes, gen case A*). This surgeon describes the general process he goes through:

*"So my steps are first of all introducing myself to the patient, and then try to work out a diagnosis whether that's more investigations or getting a senior person to give their thoughts, and then once you've reached a diagnosis then explaining that to the patient and explaining the potential treatment options. Then you give them a chance to weigh up those options. So that's a sort of typical journey you'd go on with a patient in clinic and for all new patients that's pretty much the scheme*



*you'd follow." (INT C 218011)*

The surgeons displayed differences in their responses regarding the aim of the consultation. Some openly stated that they wanted to avoid or delay surgery in favour of medical management such as pain relief, as shown below:

*"It's much quicker sometimes in a consultation to say yes to surgery than no to surgery. It's a much, much easier ... well, look, it's fine, hip replacement, these are the risks, I'm off, you know. Whereas 'no' is much harder and slower and takes more discussion and deliberation which I don't mind, I'm quite happy. But, yeah, the style of practices is hugely variable." (INT C 198005)*

Others saw a hip replacement as an inevitable outcome for patients with arthritis. Consequently, they took the view that they *"might as well just get them on the list sooner rather than later"* (INT C 198005).

It was difficult to pinpoint the driver of the difference here. It could have been linked to attempts to reduce overall surgical numbers, because of pressure from the CCGs (as was the case at Site A). Equally, the difference may be due to the belief that medical management, where appropriate, was better for patients in the long run as it delays intervention and therefore reduces the risk of subsequent hip revision surgery.

#### **4.5.1.1 Patient evidence and its effect on decision-making**

I observed two key decisions being made at this point in the process. The first was questioning if the patient was suitable for surgery, and the second was selecting which procedure would be conducted. Despite the promotion of shared decision-making and the importance of patient preferences in NHS healthcare (Barratt, 2008), the surgeons rarely mentioned the views of patients. This was the case across all three hospital sites. The quote below describes the views of a surgeon regarding patient input in their practice:

*"You know that you can influence someone on this decision based on what you say. That's inevitable and you've got to be a bit careful about it but the reality is if you have a particular decision in mind then that inevitably is the decision the patient makes. Ultimately, it's always them that say yes or no but in my experience that is very much surgeon-dependent. What I'm trying to say I suppose is yes*

*patients in theory do make shared decisions but often that's led by a surgical decision already. Very rarely does a patient make their own decision in my view." (INT C 218011)*

Some of the surgeons seemed to distinguish between conditions deemed to be the fault of patients, for example obesity, and those linked to behaviour or lifestyle, as opposed to those not deemed a result of patients' lifestyle choice. Interestingly, there was a difference in the perceived acceptance of good and bad lifestyle choices. Growing numbers of younger patients are being treated for advanced arthritis because they have worn joints, for example because of sport. In my study, there was reference to long-distance runners, horse riders and footballers who had received a hip replacement. These patients were talked about in a positive light and it was important for the surgeons who treated them to try and get them 'back to where they were before'. The old or obese patients, on the other hand, would be discussed more negatively, and seemed to be considered fortunate to be offered the opportunity to obtain a better quality of life post-surgery. Surgeons thought these patients should not to expect too much from surgery. This is reflected in my observation notes below regarding the use of language by surgeons:

*"I observed a surgeon today and noticed the language he used changed and it seemed to be dependent on who he was treating. For example, with talking about an older female patient he used phrases such as "we can't be sure" and that "we hope it will relieve some pain". Whereas when I asked him how he would select an implant for a young fit patient for comparison he said "what like for you?, for you definitely ceramic on ceramic, its proven better". (OBS notes site B clinic)*

This use of language symbolised innate beliefs, perceptions and values that the surgeons held about the health and illness behaviour of their patients. The age of patients, both biological and physical, was a subjective but very important factor in decision-making. Although this balance between age and procedure selection is well-reported within the clinical evidence, the individual decision was a judgement call made each time by the surgeon. Surgeons would talk about the 'older more active patients' needing to be treated in the same way as 'younger less active patients', as they were at risk of wearing their hip out and needing a revision procedure. This was not the case for all surgeons, as some held strict

criteria in their heads for selecting one procedure over another, as described by this consultant:

*"Well it's easy, isn't it because pretty much they can either get a cemented or un-cemented total hip replacement depending on patient factors. And that's going to be straight forward. But then when it comes to hips, of course it's physiological age rather than chronological age. And it's always going to be a cemented stem and for an elderly patient low demand, it's always going to be a cemented cup. And for anyone else it's going to be an un-cemented cup." (INT C 37011)*

Interestingly and unexpectedly, the surgeons rarely mentioned symptom severity of as a key driver for a decision to operate. For example, pain would be recorded as a symptom in the clinical notes, but a patient's description of pain seemed less important. It may be because pain was subjective, and needed to be taken into consideration with other variables. However, it may also reflect the fact that only patients deemed to have symptoms severe enough to warrant surgery were referred by the GP to the surgeon. The patient selection in these cases emphasised the interaction between patient and surgeon. A decision to operate depended on the patient reporting the correct evidence (i.e., symptom list) and the surgeon privileging the elements of the list as important in his or her context. For example, surgeons weighed the symptoms of one patient against other patients they had seen that week who had been deemed appropriate for hip surgery.

Ultimately, the decision to operate and the choice of procedure relied heavily on symptoms of individual patients and the examination that took place. Surgeons working in the NHS did not appear to treat patients unnecessarily. However, thresholds for intervention appeared to vary more in different situations. This senior surgeons from site A describe the influence of private practice below:

*"I think they have, sometimes I think some people have to say they are doing exactly in my private practice what I do in my NHS. It's a fact. Sometimes if you have discrepancies in your, in your NHS and your private practice you can get judged on that. By your peers, your clients, you know solicitors, lawyers, GMC (laughter)." (INT C 218006)*

It is important to note that there were no clinical criteria or checklists for

deciding exactly if and when a patient needed to be given a hip replacement. The current clinical guidance states that:

*"The diagnosis of arthritis of the hip is usually based on individual patient history and clinical examination assessing joint pain, deformity and reduced range of movement...Clinicians should first offer patients non-surgical treatments including exercise, physical therapy and analgesics, and should consider referring patients for joint replacement surgery if they have ongoing pain, joint stiffness, reduced function and a poor quality of life." (Doc analy NICE TA 304)*

The text above is clear, but demonstrates the lack of an identifiable objective threshold. Therefore, it was up to the surgeon to decide if the patient was 'for' or 'not for' surgery. This flexible choice could explain the variation observed in time to access surgery. The surgeons I interviewed described different approaches to making this key decision, which included indication of a particular symptom such as "lack of sleep" (INT C 218008), achieving a score on an "outcome measure" (INT C 37010) or "just knowing" when it was the right time to perform the operation (INT C 37011).

The surgeon gathered many pieces of information during the consultation, and these acted as sources of evidence for decision-making. The information included both clinical (age, range of movement) and environmental elements, such as the ideal level of activity for the patients. Any previous examinations or investigations and scans would also be discussed. The patients had to judge the severity and impact of their pain on their daily living. This meant that the surgeon had to consider self-report and clinically assessed symptoms together. All this information was combined and appeared helpful in defining symptoms and ruling out other diagnoses. It seemed that this type of evidence was added into a surgeons' mental decision matrix, which contained the other sources of evidence and knowledge which they identified as important.

#### **4.5.2 What influenced procedure and implant decisions?**

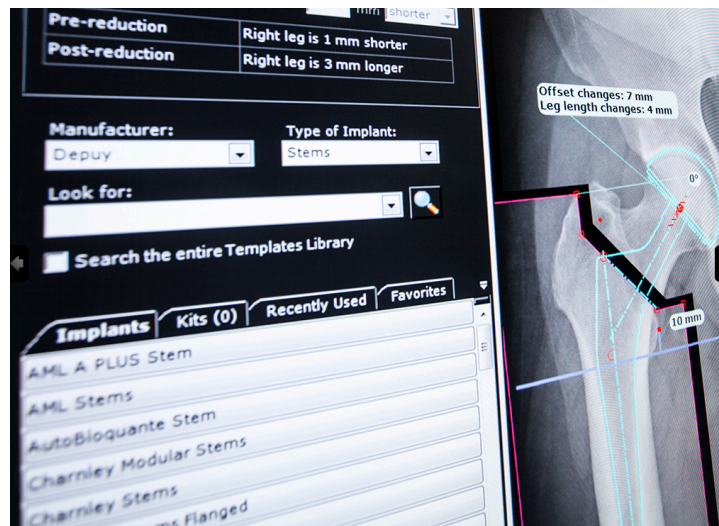
The second major decision that took place was the decision about which procedure to conduct, and to some extent, which implant to use. Sites A and B were restricted in their choices and often had only one or two options made

available to them by the Trusts. Site C, on the other hand, had a free choice of implants. However, all surgeons could select their procedures and surgical techniques, for example whether to do a cemented or cementless hip replacement or a hip resurfacing arthroplasty. There is much debate in the literature as to which of these procedures is preferable. This is often related to patient physical and biological age and their influence on likely treatment outcomes (NJR, 2015). The use of NJR data was recognised as an influential source of evidence for this decision, as described below:

*"I think you go with that, and so (brand) you could justify why you did it to your trust but, you know, as the best combination, and there is a large evidence base from the National Registry to support that." (INT C 190004)*

Despite the decision to operate, there were waiting lists at all three case study hospitals. Time from GP referral to appointment for orthopaedic patients included a wait of between 19 (Site B and C) and 25 (site A) weeks. Patients then had to wait for surgery once the surgeon had agreed it. Therefore, it was often several months before a patient was admitted to hospital for surgery. Generally, once the surgery had been decided it took place. I did not hear of patients changing their minds about hip replacement, but some did select private practice to be treated earlier.

The operation was the key event for the surgeon. It involved technical planning beforehand to ensure that the selected implant aligned to the bone structure of the patient and that the key measurements and alignment were known prior to surgery. This pre-operative planning was conducted on specialist hospital computer software (See Figure 7).



**Figure 7. An example image from typical computer software used for orthopaedic surgery planning (OBS notes general)**

The planning and positioning seemed to be innate, as the surgeons often performed it without consultation with others and without explicit evidence to hand. From the outside, it looked like an advanced jigsaw puzzle, where only the surgeon possessed the knowledge of which pieces fitted where. However, there was variation in the use of the software, as identified by this surgeon:

*"The idea being when you come to plan your operation, that's when you can see it on the X-ray. Then the software that we use now for planning the operation automatically will find the calibration marks and calibrate, scale your X-ray accordingly. But occasionally it doesn't get used. So some surgeons might just carry on anyway without it and just guess. Then there'd be those of us like me, who'd be not prepared to do that."* (INT C 218007)

At each of the three sites, the operating theatres were located away from the surgical offices and outpatient clinic areas. When the surgeons were in theatre, they did not have a presence in the rest of the hospital. It could be suggested that this separation is important in creating and reinforcing the clinical power that the surgeons hold. Only authorised people were allowed into operating areas and these had to be 'scrubbed in' wearing operating gowns etc. This was to protect the sterile environment. Locked doors and theatre uniform distinguished the surgeons and surgical staff from everyone else working in the hospital. You had to be authorised to enter this space, and it provided an

opportunity to keep unwarranted and unwanted people out. This exclusion was observed on more than one occasion across all the sites. The physical separation was a problem mentioned by the departmental managers who wanted, but could not easily obtain, access to the surgeons. I describe this in my observation notes from site A below:

*"I spent the day with the theatre manager. He spent a lot of time trying to track down the surgeons to ask them questions, or check whether the decisions he had made were suitable. Particularly around theatre scheduling. He would refer to the surgeons as "hiding in theatres". Often this seemed to be true, as the surgeons would choose to sit in the theatre lounge rather than the offices or coffee room. Every time he went into the clean area he had to get changed, he said that some days he "just leaves his scrubs on"."* (OBS notes site A TherMang)

#### **4.5.3 Nature of variation in the practice of orthopaedic surgery**

As discussed above, the practice of orthopaedic surgery was dependent on a wide range of factors. For example, the different surgeon characteristics and their various approaches to work were clear from the beginning. I was able to build on these observations during the data analysis to try to identify the nature of variation in practice. The reasons behind the variation were multifactorial and changeable. When I asked the surgeons why they decided on one particular hip replacement over another I was often told 'it depends on' X, Y and Z. These factors were inherently tricky to predict. A wide range of factors appeared to influence decisions and it was challenging to understand how the individual surgeons brokered these evidence and knowledge sources during decision-making. One surgeon describes how he attempts to weigh up patient evidence, training, experience and best practice:

*"I don't think we all think we're super clever but you do have different indications for different ages, right, so I'm sure you're aware of this, the thing that I've been brought up with, which I've seen has worked for me, and is then a bit of a, it's not a trade off, it's a trade off with best practice."* (INT C 198005)

The way this selection takes place has obvious consequences for the variation in patient selection, access to surgery, procedure and implant selection.

Differences in outcome have been widely reported in the literature (Judge et al,

2010; Appleby, 2010). Some factors related to the patients, for example if a patient was a severely disabled, older (65+ years), and female, procedure selection seemed to be much more standardised across the hospitals. This surgeon knew what was best for this specific patient group:

*"We've stuck to guidelines in the sense that the, you know, over 70, definitely is all cemented, metal and poly. 60-70 you have a bit of ceramic coming in; below 60's generally un-cemented with ceramics, with exceptions. So we've been pretty conservative in our selection here." (INT C 198003)*

Other factors centred on the surgeon and their characteristics, for example their surgical preferences, normal routines and years in practice. The junior surgeons were much more inclined to practise the way their mentor or consultant had taught them, whereas the older surgeons seemed to be influenced by their training, but also by their mindlines, which reflect experiential knowledge built up over their career, which tended to carry more weight. What was important was what worked 'in their hands'.

Further variation came from the type of equipment or "kit" available to the surgeons, including whether implant choices were restricted or not. Surgeons at site A stated that they had learned to "make do with what is there" (INT C 218011). This was because site A had moved toward single supplier contracts which restricted access to equipment. This was not the case at site C, where surgeons had more choice:

*"By and large, being a very big trust, we have a fair range of options on the shelf already, and so it's not a particular problem. But in some trusts, some smaller trusts, the choice of prosthesis is very fixed. There will be one cement-less prosthesis that you can use, one cemented prosthesis that you can use, and that will be based on tariff and local negotiation and prosthesis costs that do still vary between trusts." (INT C 190004)*

Linked to this was the logistical arrangement of the orthopaedic services and the hospitals, for example, in case C the surgeons reported that there were not enough theatres available to meet local demand. This restricted their ability to schedule surgery they believe was required. These contingencies are worth



emphasising here because they had an impact on the decisions that could be made by individual surgeons each day.

Equally important to the surgeons was the quality and skill of theatre assistants and teams during the operations, and also post-operative aftercare. Variation can be introduced by the performance and skill of surgical staff ranging from theatre nurses, junior surgeons and anaesthetists. The senior ward nurses at sites B1 and B2 had very different approaches to recovery of hip replacement patients. Patients received a differing care pathway depending on which site they were admitted to (*OBS notes site B*). The competency of the surgical assistants appeared to have a large impact on the confidence of the surgeon during surgery. The surgeons tended to have favourite support staff, and this was acknowledged and implicitly understood by theatre staff and the managers responsible for theatre scheduling. This preference is reflected in the quote below:

*"He is my consultant. I know what he likes, we go through a whole operation without saying a word to each other, we know exactly what happens next." (INT C 11904)*

The need to have a consistent and familiar team appeared in some way to act as a reassurance to the surgeons. They believed that it enabled them to maintain consistency. However, the emphasis on closed teams who conform to individual surgeon preferences might generate and sustain variation in practice.

Evidence from national data registries was referred to by many of the surgeons. This was particularly important, as the surgeons have recently (2013) undergone monitoring and ranking according to their treatment choices and patient outcomes. The National Joint Registry now routinely collects data on all orthopaedic surgeons performing hip replacements in the NHS:

*"The information being published covers elective hip and knee replacement surgery and includes details on the number of procedures undertaken and overseen by each Consultant in Charge, the units where they have worked and the mortality within 90 days of surgery." (Doc analy NJR 2014)*

Hip surgeons were also monitored on their use of evidence-based implants as a proportion of their total hip practice. This evidence rating was in accordance with the implant ODEP ratings. The quotes below show how the surgeon had contrasting views on this issue of national monitoring of practice:

*"It means that people are accountable and if you're, if you're accountable then it focuses your mind into sort of making proper and right decisions." (INT C 218011)*

*"Again colleagues of mine might have said this that on the one hand you want to use something which you know is reliable and works well and that's what the whole ODEP thing is about." (INT C 218007)*

I also witnessed a conversation about the ratings, an excerpt is provided below:

*"It states the consultant in charge, yes they may be the consultant in charge of the patient but that's not necessarily me. I am not always doing the operation, and I certainly do not know what is happening in recovery and with the physios." (OBS notes site C)*

These surgeons queried the quality of the data collected:

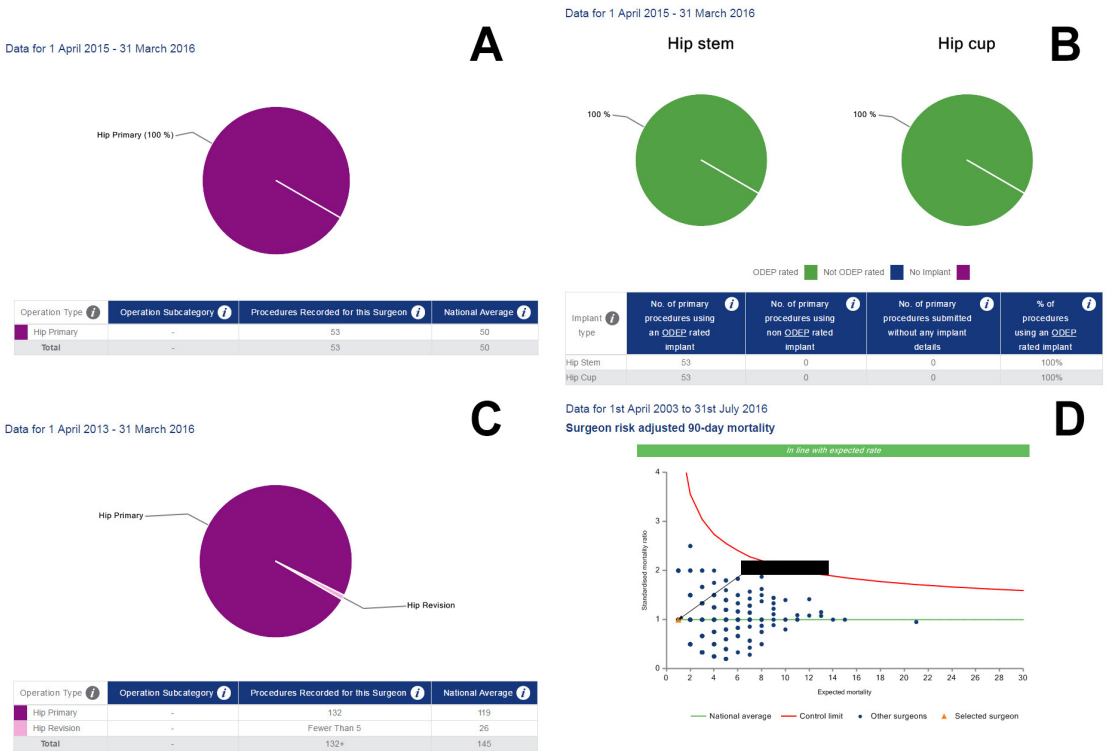
*"But yeah, the surgeon data at the moment I think's, is way off the mark. I don't think it's checked." (INT 218002)*

*"There's so many inconsistencies in it, but if we don't get our own data right, you suddenly become an outlier, and it's only because of where you put your standard deviations, that means you're a good surgeon or a bad surgeon. I think actually, you know, that's kind of, quite the worst thing that could happen to you as a hip surgeon is somebody saying, actually (name), you're not very good at your job." (INT C 218006)*

This monitoring system is freely available and allows patients and others, to access the surgeons 'practice profile' over one and three year periods. However, the surgeons I spoke to questioned whether patients would ever know this information existed, or how to find it. As described in this quote:

*"People have concerns about how patients and people might use the information but generally the sense is that patients don't actually look at it." (INT C 218011)*

I have included an example of one ‘practice profile’ in Figure 8 as an illustration of this process. According to the data, this surgeon performed 53 primary hip replacements between 1<sup>st</sup> April 2015 and 31<sup>st</sup> March 2016 (A), and 132 since records began in 2013 (C). They used ODEP rated hip implants (both stem and cup) for 100% of their replacement procedures (B) and had a risk-adjusted 90 day mortality in line with the national average (D), leading to the conclusion that this surgeon was performing well within the remit of evidence-based practice.



**Figure 8. Anonymous NJR data recorded for one surgeon (A Operation type primary, B Implant type, C Operation type primary and revision, D Surgeon risk adjusted 90-day mortality)**

Surgeons were keen to state that the implants they used were ODEP-rated, and therefore they believed they were performing satisfactorily with little variation. However, this was not the case for all surgeons, and some had particular issues with this high level of external judgement and lack of discretion regarding their practice:

*“Most of my colleagues it’s 98 percent, 99 percent ODEP rating, mine’s 50 percent because I’m doing*

*this work with this company in Switzerland to do this 3D printed guides. Because it's a Swiss company, they've never bothered with ODEP. They never have it. They've not done ODEP because it's not a priority for the Swiss market. So the unintended consequence of ODEP is that people like me who are hopefully trying to push the boundaries think it's not worth it. It's just another barrier to innovation. So that's frustrating." (INT C 218007)*

During my observation and throughout the interviews with surgeons, it seemed as though this national monitoring process was another activity that needed to be completed on paper, in the same 'tick box' fashion as complying with NICE guidance. However, it became contentious when data suggested that they were performing badly. As long as the surgeons were seen to be achieving the designated standards, this monitoring seemed to have little impact or influence on their clinical work and day-to-day decision-making. This contrasts with the message promoted by policy-makers, codified in the guidance, and even endorsed by their professional organisation. The President of the BOA at the time stated that:

*"This is an important first step towards greater transparency of surgical outcomes. I am pleased that this demonstrates that standards in orthopaedics are high – with very low levels of mortality and no surgeons classed as outliers in terms of their individual performance." (OBS notes conf BOA)*

Nationally, the data monitoring appeared to benefit the field. However, individual surgeons held very different views regarding national and transparent data collection. There was a consistent message that they should not be held accountable as individual clinicians, for the outcome of surgery conducted by multidisciplinary groups. A surgeon provides his view below:

*"But now, the information in the public domain is just ridiculous. I wrote to (name) when he was BOA head, saying, consultant level data, you can't send that out. So I have no say over antibiotic prophylaxis, our trust won't give us any antibiotics because it causes C. diff, they don't care. I have no say over how many physiotherapists are on the ward, and that must affect rehab, and if not earlier results, maybe later results. I have no say over the implants I use now. I have no say over the staffing levels in theatre. Basically what I'm saying is it is not, you know, if you go back ten, maybe, twenty, thirty years, you know, the surgeon has an awesome amount of responsibility, and could actually, in my opinion, could actually affect that by making sure things happen. I can't control every aspect of my patients care, why?, it's a team thing, you know, it's such a team thing. And they*

*put my name on the top of it, and I'm expendable, you know, my NJR data." (INT C 198005)*

Although data collected by the NJR was recognised as important, it did not appear to be a key driver of decision-making for surgeons. Instead contextual dependencies were more influential. These non-traditional sources of evidence can be grouped into themes around different types of 'dependency'. Variation could be dependent on patient factors (bone structure, pain), surgeon factors (personal preferences, routine practice) and environmental factors linked to the orthopaedic department or wider hospital organisation (which implant devices the hospital purchased). These sources of evidence appeared to be more powerful influencers of decision-making than traditional EBM guidelines or nationally collected data.

#### **4.5.4 What surgeons believed are the sources of evidence and variation in practice?**

On the whole, the surgeons did not talk about variation in orthopaedic practice in their day-to-day work. I did not observe any instances of surgeons openly referring to variation in their own, their peers' or their hospitals' practice. It seemed to be accepted that 'the way things are done around here' was the norm at each hospital site. Therefore, it was standard practice that activities and procedures would be changed by individuals or over time. This was in relation to the enactment of surgeon preferences, contextual contingencies and the practice dependencies described above.

This lack of awareness was particularly evident amongst the senior consultants who had generally been in post for a long time. Junior surgeons who were undergoing rotations between hospitals, or who had conducted part of their surgical training elsewhere, were more able to provide insight into the differences they saw between hospitals. The quote below is from a junior surgeon describing implant selection decisions:

*"I think it's, there are slightly different reasons because the hips guys are different, the only thing I can really compare it to, because the only I know, is (name 1). I mean, I've worked in (name 2) and (name 3). (Name 2) teaching hospital had everything, every different brand. It's changed now.*

*Places like (name 3) used to have three or four brands, and (name 1) had something like 18 different combinations of doing a hip replacement.” (INT C 119010)*

It is possible that variation was not well understood or appreciated by the surgeons working in the hospital. Their frame of reference was generally at the individual and local level (their teams and colleagues to a certain extent and the patient sitting in front of them, their consultation room, or the group of patients in the outpatient waiting room). Decision-making appeared to be very much made on a one-to-one basis. Seeing variation at this individual patient level is more challenging. This is reflected in this consultant’s statement about implant selection:

*“A lot of us feel very uncomfortable putting ages limits on, you can only have ceramic up to 65, because if you’re 66 and you act like a 46 year old, there’s probably an argument for giving them a ceramic, if you believe strongly in that argument. You know. So that’s, so I think policies have to be carefully worded because if you then go outside of policy and then somebody comes knocking on your door saying, “Why are you doing this?” You’re suddenly going to get stress built up, and you’re just trying to do your best for that one patient who’s sat in front of you and you’re getting lambasted left, right and centre.” (INT C 218002)*

This contrasts with a NICE approach for example, where decisions are made for populations of patients at the national level. When considering population level data, the trends and patterns in the data, including the variation that is observed, can be more obvious. National variation becomes less meaningful for an individual with a patient who has a specific set of symptoms which need to be treated, given the limits of a surgeon’s personal skill, departmental constraints and hospital funding. This is the situation that most of the surgeons I interviewed were working under, as described here:

*“I may subconsciously be sort of following NICE guidance but... it’s not helpful to me sitting there with a patient, if we are talking joint replacement and threshold for joint replacements? I can’t imagine it’s going to be very helpful at all.” (INT C 37011)*

One surgeon group varied from the others in these views. At site A, surgeons had an awareness of EBM and research concepts such as statistics, sample size and

standard deviation. They were accustomed to answering questions using a bigger population frame of reference. Therefore, they were perhaps more able to apply this knowledge in their work and scale it down to understand what it meant for their individual patient. Two surgeons from site A gave their account of this:

*"They (NICE guidelines)...help you look at cost effectiveness a lot more than I think about in my daily practice as an individual orthopaedic surgeon, because my responsibility during the consultation is directly to that patient whereas actually I do have a responsibility to the NHS to allocate resources appropriately. But it is very difficult to marry those two together in an individual consultation. So it is helpful to have that input there." (INT C 218009)*

*"I tell my patients that. You know, I'm giving you a hip which has got the least chance of failure. If they say to me, 'Why can't I have ceramic?' I say, because that's got a higher revision rate if you look at everybody across the country. So best practice and evidence, hopefully come together, but they don't always, and price is important. I think we are getting there with the NJR, which is a huge data resource which, you know, is fantastic." (INT C 218016)*

The surgeons working at site A were also keen to stress though that they conduct trials and practice EBM in a pragmatic way, i.e., they wanted the evidence to fit the context so that it worked in practice and not just in academic journals. An academic clinician describes this clearly below:

*"So to that extent the research we do will always remain pragmatic and that's the stats that NIHR have as well and support. You might want to do specialist research in the very early stages when you've got a new procedure and you want to find out if it works, but then you get to the point of is it cost effective and when you're answering those questions you want to know about, does it work in everybody's hands? So we will always argue that point essentially, it's not being done in specialist centres it's got to be done in all centres, for those reasons research will always be pragmatic." (INT C 218012)*

In summary, the surgeons believed that the sources of evidence were contingent and dependent on their particular circumstance. The variation that this produced was consequential not intentional and reflected their practice in their context. This did not appear to be considered as variation to evidence or best

practice. Instead it was considered as the 'wider evidence base' that is available to the surgeons to make decisions.

#### **4.5.4.1 Surgeon perception and beliefs about EBM**

In this section I will present further data to support my findings that the decision to operate and the procedure and implant selected are not overtly linked to traditional EBM recommendations. The beliefs, perceptions and values of individual surgeons appeared to be much more influential to practice and the decisions made than traditional EBM. The surgeons decided whether each patient constituted a suitable candidate for treatment, and whether they wished to operate on that patient on a particular day.

Some surgeons reported that difficult operations were emotionally uncomfortable and this emotive response affected their choice of procedure. For example, this surgeon states that he transfers patients to colleagues when he is not comfortable with a case. He believes that the opinion of his colleagues is importance in his treatment choices:

*"If anything gets a bit spicy in the hip arena for me either before surgery and in clinic and I've spotted it I'm passing the case on. And, post operatively, I want to know that I've used implants that the colleagues I'm going to refer onto, if I've got into trouble, are going to be happy with." (INT C 37011)*

Another surgeon quoted below referenced their emotional responses when making treatment decisions and how these impacted their ability to perform the surgery.

*"I know for some people they're really stressed by it and upset and I don't think that's been attended to. Ultimately you don't have to look after your surgeons but if you've got a stressed surgeon doing a slightly difficult operation, I wouldn't want them operating on me. I'd want them, you know, happy and confident in what they're doing really." (INT 198005)*

In certain situations the emotional response had a positive outcome and was an important factor in decision-making. Surgeons would refer to only performing



surgery that they would be comfortable “*doing on my own grandmother*” (INT C 198005). Traditional EBM approaches would struggle to deal with this level of subjectivity and the emotional beliefs of individuals. It appeared that decisions might have been influenced by their attitudes towards patients. For example, this surgeon formed a positive belief that a patient needed surgery so that he could continue his hobby:

*“I thought he should have it, so that he can get back on the golf course. That is just as important to him.” (OBS notes site C general)*

Although you can appreciate that increased physical function after hip replacement is a valid reason to conduct surgery, the attitude of the surgeon regarding the importance of golf to himself may have played a part in this decision. This personal projection is innate and might even be unconscious. In a similar way, their opinion about the presence of other diseases and medical conditions affected decisions to operate. They contributed to the symptoms which the patients reported and could increase the risk of adverse events during the surgery. For example, when discussing a patient who had a high body mass index (BMI), this surgeon suggested:

*“He (the patient) had a high BMI and therefore is at more risk for surgery and revision... but I can’t discriminate based on that.” (INT C 218008)*

Surgical techniques appeared to be aligned to surgical training, but there was a perception that apprenticeship-style training had an important role to play in implant selection in particular. This surgeon describe the process of teaching that “spawned” knowledge throughout generations of consultants:

*“Okay, if you’re a teaching hospital, remember I said who I was taught by, so if you can keep the teaching hospital surgeons happy to use your produce, they’ll be training two different trainees a year, plus fellows and everybody else. If every one of those goes away and uses the same kit, you are like spawning a generation of people using your kit. Because I know that you’ll be teaching a generation of new guys coming through the next generation.” (INT C 37010)*

Although surgical techniques varied between surgeons, even within the same

hospital site (for example a *posterior* versus an *anterior* approach) it appeared to be less important to the surgeons than types of procedure that was conducted, e.g., performing a total hip replacement instead of a hip resurfacing arthroplasty, or a cemented versus a cementless procedure. Different surgical techniques can result in the same clinical outcome and therefore this was less of an area for discussion between the surgeons when reviewing patient cases.

The surgical procedure seemed to be generally open for debate between the surgeons in meetings. This was not the case when examining the decisions made about implant type. These discussions provided the opportunity to observe potential variation in practice as different surgeons selected different options. This included variation within and between the three sites, but also variation as to what the EBM recommendations might be. I observed orthopaedic meetings where the surgeons would discuss treatment plans for operations and noted the following:

*"Some of the surgeons at today's meeting reported not being able to perform either a cemented or cementless replacement because they had not 'routinely done them in their previous role'. Others stated that they only carried out one type of procedure purely out of personal preference and beliefs that it was better than another option. One surgeon said 'So I've changed from cemented to un-cemented for young patients. Why? You could argue because cement is a hassle and it's an extra 15 minutes, un-cemented is as good as cemented and overall probably can work out cheaper if you do more cases per list. The decision over which procedure to use was not discussed in relation to EBM.'"*  
(OBS notes site B. Team meeting)

This choice in treatment options could significantly influence the variation observed in practice. It appeared that variation from the evidence reported in the academic literature was accepted as normal because the evidence itself varied so much. The surgeons implied that their own preferences and established ways of working were a deciding factor in the choice of hip procedure.

#### **4.5.5 Section summary**

This section and the examples provided have demonstrated how the individual

surgeon's beliefs and perceptions about surgical work were privileged over and above the clinical evidence presented in EBM guidelines. Decisions might be aligned to the clinical evidence, or to other sources of evidence or knowledge both about whether to offer surgery and which type of surgery to offer.

#### **4.6 Cross-case analysis: Individuals**

This section has focused on the orthopaedic surgeon as an individual clinical professional making a decision. These individuals were examined in the context of the three hospital case study sites. Therefore, there are likely to be some individual characteristics driven by the distinctive influence of working in a particular hospital, for example, the trend for surgeons in site A to reference scientific evidence in decision-making. The contextual drivers contributed to the variation which originated from the individual surgeons. The decision each surgeon made might have been constrained or shaped by the contingent and dependent factors discussed in this chapter. Table 10 presents an overview of these individual level factors by hospital, highlighting where each hospital sits in comparison to the others.

**Table 10. An overview of the individual level factors by hospital**

Theme features	Site A	Site B	Site C
Presence of traditional EBM in practice	<i>EBM and innovation as core to the hospital</i>	<i>Limited – compliance to monitored standards</i>	<i>Limited in the hospital. EBM identified in those surgeons located at the University.</i>
Empirically-derived surgeon characteristic types	<i>Strong majority of gold-standards. Some mavericks and innovators</i>	<i>Mixed types</i>	<i>Mixed types with tendency towards gold-standards</i>
Autonomy and decisive decision-making by the surgeons	<i>Shared/open approach to practice with discussion to facilitate training of juniors</i>	<i>Strong professional autonomy</i>	<i>Strong professional autonomy within orthopaedics</i>
Resistance: beliefs about evidence and NICE informing practice	<i>Strong influence of EBM as the value. Little resistance in practice</i>	<i>Little influence from board to ward. Strong resistance by senior surgeons</i>	<i>Some resistance; more likely to favour local guidelines over national guidance and evidence</i>
Power: retaining power over the evidence and decisions and the belief that orthopaedics is different	<i>Power was aligned to evidence and RCTs to inform decisions. Orthopaedics not different</i>	<i>Retained significant power over knowledge and evidence. Orthopaedics is different</i>	<i>Strong group membership to retain power through specific orthopaedic practice and knowledge. Orthopaedics is different</i>
Enactment: experiential knowledge and education	<i>EBM experience was important, all surgeons trained in EBM as standard</i>	<i>Strong professional hierarchy and belief in experience over evidence</i>	<i>Strong influence of education. Most surgeons at this site had trained and remained there so formed experiences together. Demonstrated strong norms shared by individuals</i>
Nature of variation according to national data	<i>Individual surgeons were compliant to ODEP rating 98-100% of the time</i>	<i>Individual surgeons were compliant to ODEP rating 99-100% of the time</i>	<i>Individual surgeons were compliant to ODEP rating 100% of the time</i>

## 4.7 Summary of the theme

In this theme, I assessed the role of EBM and the use of different types of

knowledge in decisions made by the individual surgeons. Within the literature, theoretical assumptions regarding tacit knowledge and mindlines have challenged the rationalist view of EBM and guidelines. Traditional EBM assumes that a single knowledge reality exists and can be written down and shared in practice. This is associated with the risk of apparently removing the contextual elements, constraints and contingencies of healthcare, and replacing them with universal generic rules of practice. On the other hand, knowledge developed through experience and over time is considered to be grounded in a dynamic, embodied and subjective view of evidence, where context is purposefully acknowledged as important, and where conflicting and parallel versions of reality appear to coexist.

This theme has demonstrated how this wider subjective view of evidence and knowledge interacts with practice and the different ways that knowledge is mobilised. This allows for variation in practice at the individual surgeon level. I considered the views of each surgeon regarding their clinical practice by examining what they saw as the source or sources of evidence and knowledge for their practice and I considered how these might contribute to variation. My investigation uncovered individual beliefs, perceptions and values of orthopaedic surgeons as reasons for variation in surgery. More importantly, I reflected on how these innate drivers were enacted in the delivery of services. One important factor appeared to be the lack of importance attached to the evidence and knowledge emanating from traditional EBM approaches.

Variation in views and beliefs was observed both across and within the three sites. Surgeons displayed differing levels of trust and acceptance towards EBM and NICE guidelines. The findings suggest that these differences were linked to characteristics types which influenced behaviour, decision-making and actions. Interestingly, the three types of surgeon (innovator, maverick, gold-standard), all demonstrated similar levels of autonomy, discretion and decisiveness in their decision-making practices, but these were differently enacted in practice. This autonomous way of working appeared to be unrelated to the privileging of evidence and instead reflected the view that orthopaedic surgery is 'different'.

The importance attached to evidence and knowledge from traditional EBM approaches and the variation in views and beliefs observed appeared to have a significant impact on the practice of hip replacement. It seemed to influence the level of resistance to use of evidence in practice, such as NICE guidelines or national data. This resistance enabled surgeons to retain power over their decision-making preferences. Resistance and individual power seemed to be supported by a strong reliance on experiential knowledge drawing from an apprenticeship-style education and training.

This theme has provided an assessment of traditional evidence, and the meaning of EBM for orthopaedic practice within my three sites. For the surgeons, the selection of patients and the choice of procedure and implant were clearly dependent on a wide range of patient, surgeon, environmental and contextual factors which, although they included traditional EBM, varied considerably. In the interviews, the surgeons suggested that difference could be considered a normal part of orthopaedic practice, but this notion of 'normal orthopaedic practice' was constantly adjusted to deal with each individual patient in each particular situation.

## **5 Results 2: Orthopaedic Communities of Practice**

### **5.1 Introduction**

This theme represents the small networks and communities to which individual orthopaedic surgeons belong. It illustrates the influence of groups of professional in knowledge and evidence mobilisation between individual surgeons and across hospital organisations.

This theme explores the professional norms found in orthopaedic CoP and how they appeared to impact on practice and how decisions were made. Mentors were influential, and there was a dominant trend for situational learning in each case. This might be because the group norms defined what behaviour and decisions were acceptable practice for each group. Norms were linked to group decision-making but allowed for individual exceptions or deviation from the organisational standards.

Norms that originated from wider national and international orthopaedic groups were consistently present in the data. This higher level of influence covered how professional networks, professional societies and influential experts in the field of orthopaedics manipulated individual and group decision-making. This orthopaedic CoP theme highlights the central role that implant manufactures and their representatives play in decisions made about treatment. This external commercial influence was frequent and the findings suggest that it had the most effect on the group as the unit of analysis. Throughout this section I will provide examples to demonstrate how local and national group norms establish variation in the use of evidence, and how this affected the knowledge mobilisation within each hospital.

### **5.2 Defining concepts and determining meanings for this chapter**

The key concept that needs to be defined for this chapter is the meaning of a group and where the established group boundaries lie. Findings from the three

hospitals and individual interviews illustrate various meanings of what constituted a group. There was a mismatch between the group as the wider orthopaedic department, i.e., all surgeons working at the hospital, the group as the immediate closed colleague membership as defined by the individuals, e.g., their team, or the orthopaedic group which encompassed all orthopaedic surgeons working in England i.e., members of the Royal College of Orthopaedic Surgeons.

What the individuals considered a group during interviews remained fairly stable and participants distinguished between the levels of the group using their own language, for example referring to *my colleagues*, *the hip guys* or *my network*. However, the lines between the group boundaries blurred when I observed surgeons working or talking about situations outside their normal organisation, such as at national conferences. In this sense, the surgeons would classify themselves by the area of the body that they specialised in, for example hip surgeons or knee surgeons. These closed groups had requirements for entry, e.g., membership of the British Hip Society, but were not confined to the geographical location in which the surgeon worked. The majority of surgeons demonstrated this flexibility in their group boundary definition, depending on their current situation.

### **5.3 Characteristics and professional norms of orthopaedic surgeon groups**

My research suggests that orthopaedic surgeons are a particular type of professional group whose behaviour, performance and decision-making is driven by many factors, including those mentioned in the previous chapter, such as personal identity, beliefs and values and job role status. Over and above these factors, the data revealed the strong influence of wider group membership and professional norms on practice. These professional norms develop when professionals working in the same occupation share a specialised or theoretical knowledge. Norms can encourage professionals to act and make decisions in a similar way, despite the influence of their organisation, industry and personal incentives. Within orthopaedics, there appeared to be strong professional norms



that standardised the behaviour of the surgeons. The surgeon below describes how they learned to act in accordance with their team and colleagues:

*"Yeah, I think it depends where you are to be honest and where you're trained and who is around you, are you heavily influenced by your peers and your seniors. Medicine is quite repetitive so the more you, the longer you are in medicine the more things you see commonly, the less novel they become and the behaviour becomes, you know, more standardised." (INT C 218010)*

Group norms are not specific to the orthopaedic surgery profession as every group generally has a set of norms that guides their behaviour. Norms can act as a 'code of conduct' about what is deemed acceptable behaviour for the group. This is evidenced in the quote below when the surgeon states that *"it's very difficult to function"* if he did not conform to the standards. The norms across the groups in my study varied, some would be strictly adhered to whilst others allowed for a range of behaviours amongst the surgeons. I asked the consultant quoted below to describe his decision-making around implant selection. He suggested that the group he worked in factored into the selection process. However, he also highlights that not all members of the group consistently adhere to the norms:

*"That's a really good question, and if you ask ten orthopaedic surgeons in a room you get ten different answers right...? But that's not strictly true. What your colleagues use, okay? So the question is, why do I use what I use? There's no point in me saying I'm going to do all un-cemented, if the clinical director comes up to me and says (name), we're not doing that because we don't like it and it's too expensive. In site B we only ever use one hip. I thought, okay, fair enough, and I kind of think if you've been trained appropriately you can use different implants, there's a learning curve and you have to be aware of that." (INT C 37010)*

Group norms were usually hidden or implicit to members of the group and new consultants appeared to find it difficult to understand and conform to these implicit norms. For example, when a new member of staff joined the department at site A he was consciously aware that group norms existed but it took him a significant time in practice to discover what they were, and then how to conform appropriately.

### 5.3.1 Deviation from group norms and conflict across groups

Deviation from the established group norms appeared to result in both covert and overt disapproval by other colleagues. I observed and discussed this departure from the norm at the intra-departmental group, the organisational groups and at the national group level. An example taken from my field notes of the BOA conference in 2015 demonstrate this point. I observed the open discrediting of a speaker by audience members because the surgeon presented findings that contradicted the established norms of the audience:

*"His talk argued against the dangerous use of 'mix and match' implants from multiple manufactures. However, there were multiple (and I felt unnecessary) interruptions from audience members who stated that "well we all do it" and that it was "normal practice everywhere" with one member even saying that "the implants are all made in the same factory so why does it even matter". This final comment resulted in laughter from the rest of the audience. It appeared that for this conference you should only present topics that will be acceptable, otherwise you may be ridiculed". (OBS notes BOA 2015)*

I observed multiple groups with distinctive norms across and within the three hospitals. This was specifically the case at site B, where disagreement about the norms of practice appeared to lead to conflict and separation amongst the orthopaedic team. There were two distinct groups who appeared to possess divergent group norms and beliefs regarding treatment and implant selection decisions (B1 and B2). The observations I made during '*rationalisation meetings*' within the department demonstrated confusion and conflict about norms which led to frustration by staff, disagreement and lost momentum in the hospital's rationalisation process. Eventually this process was delayed by four months.

In the meetings, the surgeons from the opposing groups struggled to agree on which hip implant to use across both sites. When asked why they cannot select one type there were statements including "*we're not using that*" and "*there's no junk kit here*". They appeared not to want to select the implant devices that the opposite group were using. There were also comments that reflected their beliefs about having to perform surgery with an implant that was not the established norm for them "*will I have to change?*" and "*It'll be a risk to the*

*patient" (OBS notes B1M 2015).*

At site B, the overall discussion of norms by both groups simultaneously hindered the progress of the department and Trust as each set of norms was deemed inappropriate by the other group. This appeared to reflect the strong emotional bonds that the surgeon groups held over their particular norms regarding implant choice. These were very difficult to shift and change through intervention by both management teams and other orthopaedic colleagues, despite the level and type of evidence presented in support. The managerial leads of the rationalisation process reveal in the quote below the difficulty and "*fallout*" they had in trying to complete their work on this project. In the end they had to escalate the issue to the surgical board to force a decision to be made:

*"So they passed it in the surgical board. Okay, so then it's done. So we said to them, "It's done." So then there was the fallout because they didn't actually think we would ever do it. So then there was the fallout and lots and lots of threats and whatever but, you know, they could actually get on with it. Soon after that we did that there was lots of fighting there because they... It was so difficult." (INT M 37005b)*

#### **5.3.1.1 Special case surgeons**

During the data collection I encountered individual surgeons working as part of a group who could be classified as an exception to the norm, or a special case surgeon. They were special because their behaviour deviated from the group norms but they appeared to be able to maintain their respected position within the group. The deviation was accepted or minimised by their colleagues during interviews, rather than reported as a source of conflict. The ability of these surgeons to achieve this special case status appeared to be linked to their seniority or specialisation within their group. For example, the deviant surgeons in site A and C performed techniques and selected implants that other group members would not use or openly recommend.

Some of the special case surgeons had "*been around a long time*", and nobody including the departmental manager felt able to challenge their established practice. The quote below from a manager of orthopaedic services describes

how this played out. In the end the manager waited for the implant to be discontinued rather than challenging the choice of the surgeon:

*"It is, it is very hard, it's very hard to change them, because I've been doing this job for so long I sort of understand it and I've worked with some of these guys for years. And we had only one consultant that used to use it (brand name) here but that was his hip so, whatever and they phased it out and he didn't want to move on to the new replacement if you like. So it came to the stage where I had to say to him, you know, you can't get it any more, you can't replace the parts that you are using, it's gone, it's finished." (INT A 37016)*

Site A was slightly different because one special case surgeon was allowed to deviate for what appeared to be positive reasons. This was due to the belief that he was the innovator of the group. His practice opposed that of his colleagues, but he was able to justify it to them and others through the claims of improving the current state of the art in orthopaedics. It appeared that EBM was the accepted group norm at site A, but he was able to do things differently because innovation is what he does as *"Mr Innovation"*. This belief was also endorsed across the hospital with promotional leaflets and showcases of his work. When I interviewed this surgeon he understood that he was different and aligned himself to being an outsider of the group, but with the ability to influence to group. An excerpt of the interview demonstrated this belief:

*"When I started doing it, I started testing it on a few patients of my own and when it seemed to be working and I'd got it to a point where it was now becoming useful, I then approached my three or four key colleagues who do most of the hip replacements and said, look, this is what I've done and what do you think and showed them how it worked. Because I got on with them and we were friends, they were very open and receptive to it...I'm Mr. Innovation." (INT C 218007)*

#### **5.3.1.2 Stereotypical orthopaedic surgeon groups**

Not all knowledge of the group norms was implicit and restricted to the orthopaedic surgeons. The managerial and administrative staff appeared to use the norms of the surgical group to develop categorical stereotypes of surgeon behaviour. Examples of these stereotypical orthopaedic group norms included the open expression of their beliefs and views, interrupting or challenging a meeting chair, volunteering their own opinion as 'evidence' and the importance

of making their voice heard. This appeared to be independent of the topic under discussion and reflected type-cast behaviours of the surgeon groups. I observed how these common norms amongst orthopaedic surgeons played out during multidisciplinary meetings. The quote reflects a meeting demonstrating how staff stereotyped the “*orthopods*”:

*“And we had to temper, because they would have been more aggressive than we were. So, you know, we did have to temper them. You know, as you would, and it was difficult. Even the hip one...was openly hostile. You know, they’re all fine individually.” (INT M 37005b)*

These stereotypical assumptions might reinforce the behaviour of the surgeons who then enacted a self-fulfilling prophecy about how they are allowed to perform in meetings. It appeared that the surgeon group knew it was assumed that their specialty would behave this way and that this seemed to be tolerated by others. However, this appeared only to be the case at middle-level management meetings and below. When I attended and observed higher-level hospital board meetings, the surgical representation and behaviour conformed to the norm of the organisation, and the conduct of meetings at that senior level. At a certain implicit level within the hospital hierarchy, it appeared that the surgeons recognised where their professional norms ended and they behaved appropriately, i.e., to the wider organisational norm.

## **5.4 Types of knowledge that act at the level of the group**

During my data collection, decisions appeared to be largely dependent on processes of decision-making specific to each hospital site. For example, site B tended towards individualistic and hierarchical processes, whereas sites A and C seemed to favour a group consensus approach.

What was considered a valued source of evidence was important, particularly for how the groups of surgeons privileged different types of evidence and knowledge during decision-making. Within this theme, the findings revealed four key sources of evidence and knowledge which appeared to influence group decision-making across the hospitals. These include the impact of professional

orthopaedic societies and networks, the role of situational learning and mentors, insights from surgical opinion leaders and the influence of implant manufacturers and their representatives. Each will be discussed in turn in the next few sections, with empirical data to illustrate the ideas.

#### **5.4.1 Professional societies and networks**

Dopson and colleagues (2002) suggest that it is important for individual providers of healthcare to belong to an established profession. The orthopaedic surgeons in my study appeared to take great pride in their membership of professional societies and networks such as the BOA, The Royal College of Surgeons and The British Hip Society amongst others. These types of memberships acted as a 'badge of honour' and a method of differentiation and distinction. They could also be seen as a means of establishing power and retaining substantial autonomy, authority and control over decisions made within their sub-specialty group and organisation as a whole. The quote below demonstrates how one surgeon felt that he had to comply with the societies' norms even though it went against the results of a recent RCT:

*"You know you look at your peers who do, so you go to meetings, Society meetings, and they're all talking about how they fix them and stuff like that, so you feel almost that you've got to do what they do, to fit in with the society sometimes, but now because of the trial I've definitely fixed a lot less but it's not very cool as you know, but you know people in the Society no matter what you say are going to fix it."(INT C 218006)*

The knowledge from the specialist societies appeared to be a highly privileged source of evidence which could enable the orthopaedic surgeons to resist external intervention from outside the group. When hospital management or policy-makers attempted to change orthopaedic practice, it would not be deemed as important to the surgeon because it had not originated from within their professional society. This is reflected in the quote below from a surgeon who would prefer guidelines to originate from his professional society rather than from "random people" at NICE:

*"I have looked on who was on the steering group for that particular (NICE) appraisal, and it wasn't an overwhelming number of orthopaedic surgeons, it worries me that it's almost imposed rather than ... what I would say you should do is go and get a specialist society the BOA, to get their hip*

*guys, someone like me to go and look at it, rather than having the most random people, who I don't really connect with." (INT C 198005)*

#### **5.4.1.1 The group insider-outsider dynamic**

I found many examples of a group insider-outsider dynamic in the data. For example, my observations revealed that when surgeons and managers met to review service redesign plans at site B, any reference to a procedural protocol or service design which had not been developed within site B was generally not accepted as a valid evidence source (*OBS notes site B SRD*). This was an instance of 'not invented here syndrome' which has been observed in other areas of the NHS and reflects the dominance of organisational culture as well as group norms (Millward et al, 2005). Within my study, it was the tendency of the individual surgeon in the hospital organisation to reject a seemingly suitable and sensible idea that had originated from a source outside the group, in favour of an internally developed solution.

During my observations, this rejection ranged from a mild reluctance to share best practice from another Trust, to the outright refusal to even consider it as an option, often without any apparent consideration. In an orthopaedic meeting I attended, one surgeon said, "*I'm not using that*" and pushed a document to the edge of the table when he was asked to review a form from another department (*OBS notes site B SRD*). However, I could not identify any concrete evidence that the outside approach would be inferior, or that the internal approach would be superior or vice versa. This signified to me the importance of the surgeon group in being able to identify and define 'their' own reputable sources of evidence in 'their' department and hospital. As highlighted in the previous quote, the surgeon appeared to accept treatment guidelines from the BOA over and above those disseminated by NICE, because they had been developed by a group of insiders, i.e., other surgeons.

The professional organisation was also considered an effective source of evidence to assist day-to-day decision-making for the groups of surgeons. There were many instances of guidelines and reports from professional bodies being used in decision-making and teaching in the departments. I often saw excerpts

and diagrams from these documents displayed on the walls of the orthopaedic departments and offices. It appeared that their presence was the norm when compared to outsider organisations such as NICE. This quote illustrates a surgeon referring to BOA guidance as “*simple*” and useful:

*“A good example, if you look at the BOA things...they were one page guidelines, how to treat open fractures, and they have, I can send you some if you remind me, but they are really useful clinically. I haven’t got any on me. There are some up in theatre. They’ve just produced a few more, but they’re simple and we can use them. So I don’t know what we need to do with NICE.” (INT C 198005)*

On the whole, the norms of the professional orthopaedic networks and societies appeared to lead professionals from the same group to behave and act similarly. This was regardless of their particular specialty interest and personal incentives. When interviewing the surgeons about their process of knowledge selection, they would often refer to being influenced by discussions and presentations that took place at national conferences. These appeared to achieve a wider reach and memorable impact on the surgeons. They often declared that they “*saw something at a conference*” and then wanted to bring it back into their practice. The consultant quoted below reflects on hearing a “*brilliant*” talk at a conference, and being inspired to change practice, based on what he had heard at a presentation the day before:

*“You know getting into the presentation on fractures that was presented at the Society, and it was brilliant, it was the best presentation I think I’ve ever seen. I’ve taken the view that I generally believe in the study and you know it’s the grey area.” (INT C 218006)*

#### **5.4.1.2 Trust in evidence that originates from professional groups**

The findings revealed that the use of professional evidence in decision-making was likely to be complex and fraught with political challenges. Interview participants often also discredited or approved of information from conferences due to beliefs about the particular individual presenting, or the academic group where the work originated. This issue of trust might be linked to how surgeons maintain their elite position in the wider clinical field. As described in the literature reviews, professionals privilege the normative knowledge of their group and therefore their own clinical specialty over information produced by



others in the field. For example, presentations delivered by other academic groups would be privileged over and above clinical guidelines produced by policy-makers such as NICE.

This seemed to be particularly the case if they felt that a report or guideline might have a negative impact on the discretion they exercised in their group and over their practice. Various surgeons reported concerns regarding the wider political influence from the Government on guidelines that are produced. This surgeon suggests politicians are interfering with NICE guidelines:

*“So NICE has a, you know, it’s a tight rope, but it is at a whim, like the NHS is, of being interfered with by politicians. I think most doctors just hate that, don’t we really?. Like when [politicians name] said we’ll stick an extra £200 million into the cancer drug budget, you know, why should, why are they any more needy. They’re politically emotive decisions.” (INT C 198005)*

In addition some sites did not trust evidence that came from implant manufacturers, preferring more ‘impartial’ sources, for example within site A, the group norm was to conduct and promote EBM, hence this group appeared to privilege knowledge resulting from RCTs and journal articles. One example is shown below:

*“Yeah, I mean I’d say in our department it’s very openly discussed but more so because we’re a clinical academic department. So there’s posters everywhere for trials that are currently happening and I suppose an example we recently completed a trial looking at distal radius fractures which is a very common simple thing that comes through clinic all the time. These patients, these particular patients need an operation and we compare two different types of operation and we found that there was no difference between them but one of the operations is a lot cheaper than the other one, so there’s a cost effectiveness element to it. So as a result of that coming through just in the last couple of months the unit’s changed practice and we no longer use the other operation. So that’s an example of how evidence does directly influence what happens within the department.” (INT C 218012)*

Surgeons in site A talked about being cautious of the underlying message of conference presentations and who was paying for, or “sponsoring” the talk. They appeared to take a critical stance on evidence that came from elsewhere and were strict about which conferences members of staff were “allowed” to present

at (*OBS notes site A gen*). To me, there was an assumption that individuals at conferences would be influenced by the implant manufacturer who had paid for the attendance and presentation of particular surgeons. Orthopaedic surgeons at site A were reluctant to take sponsorship in any way as they believed it negatively impacted on their competing interest declaration statements for journals and grant applications. This is shown in the quote below. I did not observe this at any of the other sites I visited and it demonstrates the power of this group norm at site A.

*"They always have stands in the foyers always advertising the next new thing, whatever they're doing. And they sponsor a lot of things as well, so they'll take a group of registrars or orthopaedic consultants out for dinner and pay for drinks or ... there's a lot of wining and dining in the hope that they will then use their particular prosthesis. In some cases, because we're quite a clinical academic department there's obviously issues with conflict of interests so certainly all my colleagues don't engage in those activities, just because if you do engage in them you then have to declare it on your grants and publications. It's all a bit of a headache, all for a free dinner! Not worth it." (INT C 218012)*

#### **5.4.2 Situational learning and mentors**

I have described how professional norms can establish the knowledge base of groups, and therefore determine the type of knowledge deemed acceptable for those who belong to that group. My findings demonstrate that the knowledge deemed acceptable in orthopaedics was not always stable. The norms and recommendations that appeared to be commonly known and used by the members of the different groups often varied by hospital, and even within single orthopaedic departments. Previous research (described in Chapter 2) suggests that this is associated with how the groups of surgeons learned to practise within their own particular situation.

My empirical work revealed that the knowledge of what it was to be an orthopaedic surgeon was nuanced, and at site A differed from sites B and C. This is demonstrated in the statement below from a consultant surgeon at site A. He recognises that the practice of his trainee surgeons is built on the EBM approach because that is what they have learned to do in his group. This enables them to function within the department:

*"I've got 20 or 30 trainees at any time in the program, because the clinical trial stuff in particular has been embedded in their training for as long as they can remember it's normal. So our guys don't have any ... it's second nature to them to include people in clinical trials and they'll be randomised and we'll decide what intervention on whatever basis and what's been randomised. So for them it's normal. So I guess they're ... but they're an outlier probably in the UK." (INT C 218008)*

This situational learning might make it difficult as an outsider to understand the granularity and variety of knowledge that exists within the orthopaedic groups. The universality assumption by organisations such as NICE that codified clinical guidelines can be implemented in a 'one size fits all' approach appears to be wholly inappropriate to this clinical situation. My findings revealed that even the 'home-grown' Trust policies were difficult to consistently uphold in the three sites.

#### **5.4.3 Group knowledge differentiation**

Throughout the period of observation, it became clear that the three sites had developed specialist expertise which enabled group differentiation. In site C this was knowledge of complex hip revision surgery, whereas site B promoted their ability to use a particular type of implant consistently. This differentiation created asymmetry in the information and knowledge that was used between the groups of surgeons. For example, it appeared that the surgeons in site B might not have the knowledge and technical skill to perform the complex revision surgery which took place at site C. Similarly, the non-academic surgeons at site C might not be able to function in a group who structure their orthopaedic services around the ongoing RCTs (site A).

According to the literature reviewed for this research, the tacit knowledge existed within the orthopaedic groups and remained within the group because it could not easily be controlled, codified and spread. The specialist group knowledge included things like the stage at which hip replacements were conducted, the complexity of a technique, the recommended waiting time for surgery and the types of implants that were normally used in each site. Over time, through the training and development of group members, the specialised knowledge appeared to develop as the norm at each hospital site. This was

described earlier in the example of training surgeons to adopt EBM as standard practice. This difference between the groups is a source of variation in practice which has been reported in the literature.

#### **5.4.4 The transfer of knowledge within groups**

The within-group legacy knowledge which I observed appeared to be linked to situational learning and the status and influence of mentors or important peers. Within the orthopaedic specialty, learning traditionally takes place in an apprenticeship style i.e., learning one-on-one from a senior colleague. The senior colleagues appeared to be highly influential in the development of knowledge of the junior surgeons in the group. During my observations of departmental meetings or patient planning sessions there were many references to *“when I was training”*, or *“what MY consultant did in this situation”* (OBS notes general).

This evidence source appeared to be particularly influential in decision-making when no other obvious option existed, for example when a patient had an abnormal bone structure. In my observation notes of a morning planning meeting, one senior surgeon suggested that he contact his previous consultant who was retired *“as he may know what is best”* in this situation. The other surgeons in the meeting were not opposed to the idea (OBS notes site C TPM). This type of learned knowledge persists in the future, when the surgeon takes up a consultant role and begins to train the next generation of juniors. It appears that this cycle of relying on the experience of seniors and trainers is perpetuated and reinforced by surgeons working as a group who access and implement the same knowledge base as their colleagues. I have included a quote below from an interview with a surgeon to show how long-term knowledge within groups influenced decisions about treatment pathways:

*“I’ve been here now 24 years and I think that’s partly our background, what I was brought in to. So, we’ve sort of looked at different regimes with different patients and come down to the fact that you don’t need many; we still believe that and we still practice that. I’ve been very fortunate with the guys that work here, most in fact were my trainees anyhow.”* (INT C 198003)

#### 5.4.5 Challenges to group norms

Despite the established in-house training processes, all the orthopaedic departments I visited mentioned the need to maintain their group status in the long run. To do this they reported challenging what they thought was bad or deviant practice before it became widespread and therefore difficult to overcome. I found very few specific examples of direct challenges between group members in my data and observations. This was the case at the consultant peer-to-peer level and also between junior and senior staff. However, I did observe challenges from senior to junior surgeons, although this would be expected in a hierarchical system. For example, a senior surgeon at site A reprimanded the technique of a junior surgeon, stating that *“it didn’t matter what he did elsewhere, because... this is how we do it here”* (OBS notes site A gen). The surgeon below describes how there was pressure for the trainees to *“sit back and listen”* and conform to the norms of practice within the sites, rather than challenge what was discussed in larger group conversations:

*“I think most of the time you sit back and listen, if I’m honest, although I think you will have your own opinion, unless asked in that meeting you probably would not, you know, voice your opinion unless you felt really strongly.”* (INT C 218010)

Both sites B and C mentioned one example of challenging practice when a minority group of consultant surgeons decided to implement a new surgical technique (hip resurfacing) into the standard hospital practice. The surgeon quoted below illustrates that not all surgeons within the group immediately followed this apparent innovation:

*“Some did, less so now. I think the resurfacing business was a big one where everybody saw it in the papers and all they saw was this so-called great news, so the resurfacing that was quite pushy for a time and less so now.”* (INT C 198003)

Years later when the technique was shown to be ineffective and possibly harmful to patients, the consultants were quick to describe how the deviant practice went against the group norms, had lowered the standards of the hospital and caused problems with data, finances and hospital outcomes. The consultant below

states that the majority of surgeons in his group were happy to “*sit back and wait to see*” what happens with new technology, before they changed their practice or challenged their colleagues:

*“We work as a group in the sense that we meet every week and we discuss cases, usually what’s planned going forward. And there were some cases which you know, something has gone wrong, so we sort of critique each other’s performance to a degree. So we’ve kept our own, well we have done for years here, we know it works. And then these new things come along and we’ve sort of looked at them from distance, and thought, “Well hang on, that may work for case ‘X’, let’s talk about it”. Others have brought it in and used it. But we haven’t sort of jumped at the latest tool.” (INT C 198005)*

The situated learning from group members appeared to be a source of practice-based evidence that could not be found elsewhere (i.e., in the guidelines, journals or professional society reports) but was very important to the surgeons in my study. The group knowledge reflected the complex brokering of evidence that takes place by the surgeons as a combined unit or CoP. Using the example above, the group of surgeons weighed up the evidence that originated from the implant manufacturers with the established norms of their group of colleagues. They came to the conclusion that they “*know*” their established practice works and decided not to implement the hip resurfacing. However, the surgeons reported difficulty in brokering their practice-based group knowledge against recommendations from outside organisations such as NICE, as demonstrated in the quote below:

*“You were talking about where surgeon’s (knowledge) base is, what we all think we do as surgeons, but we really don’t, is look at levels of evidence don’t we? Are you aware of that? We know best because we always DO. There is some of that of orthopaedics, or experience, I’ve done a million of these, and it works if you do this, which isn’t, you know, it’s anecdotal, you know, its low down. But I think where NICE is, NICE allegedly, does take the facts into account, whatever you call the facts, you can prove whatever you like with a paper.” (INT C 37010)*

#### **5.4.6 Retaining group autonomy over decision-making**

It is important to reiterate that even though the surgeons in my study were members of a profession, they possessed individual professional status with the authority and discretion to change their own practice. The group membership

did not guarantee that all individuals conformed to established group norms. The surgeon below reveals how “*strong minded surgeons*” usually win out when it comes to implant selection decisions within his Trust:

*“I don’t know how it happens actually and I don’t think most consultants do either. I don’t ... it’s usually in collaboration but you see the strong minded surgeons who get involved and if that strong minded surgeon happens to want the most expensive, least cost effective solution in a particular hospital then that is what happens unless someone takes that decision away from them.” (INT C 218011)*

It appeared that autonomy over decisions could not be withheld from the professionals. This was the case for both their close colleagues and particularly the hospital management and policy-makers. What seemed to influence variation in practice were the individual differences between the surgeons and how these manifest themselves within the groups. The motivation to follow group norms can be both intrinsic and extrinsic. Group norms developed through practice, and were internalised as the best way to do orthopaedics for each particular group within the three hospitals. The desire to appear credible in the eyes of professional peer groups and especially professional mentors seemed to be a strong determinant of behaviour and of evidence use for the surgeons I interviewed.

Situational learning provided group knowledge which was seen as a collective good for the surgeons. It appeared to be indispensable to practice as well as generating power and autonomy for the surgeons within the organisation. This relates to the existence and enforcement of formal and informal professional norms that were an important part of orthopaedic surgeon identity. During my observations, an area of particular conflict between surgeons at site A and the local CCG emerged. It was about the allocated thresholds for hip replacement surgery. Interviews and observations of meetings at the CCG revealed their aim to set thresholds for providing surgery linked to patients’ BMI and fitness for surgery. It appeared that the evidence base for these decisions was lacking, and the surgeons I spoke to made assumptions that it was linked to cost reduction or an attempt to reduce demand for hip replacement in their area.

Observations of meetings at site A revealed that orthopaedic services were *“under pressure to reduce the number of hip replacements they were conducting as they have already gone over their allocated budget spend for the year during the third financial quarter” (OBS notes CCG Site A)*. The collective group of surgeons was able to assume authority and challenge the CCG’s position to prevent the arbitrary cut off for THR surgery. They provided a consensus statement detailing established orthopaedic criteria, where no cut off exists. This evidence from the wider orthopaedic group seemed to carry significant weight with the decision-makers at the CCG. An attempt by the hospital management or an external body (such as the CCG) to sanction decisions made by the surgeon group appeared to backfire. The group were powerful in their opposition to the proposal.

The conflicts produced by specific clinical decisions taken for financial reasons and as a result of financial pressures were evident during my study. Across all three sites, I observed a struggle to balance supply and demand in orthopaedic services. Often discussions took place between surgeons regarding decisions ‘for surgery’, for example how long a patient should have to wait, and could they be referred elsewhere for treatment, such as a physiotherapy department. The final decisions appeared to depend on their subjective view of what was appropriate for their context; this looked to be contingent on their practice and current situation.

At site B, surgeons appeared comfortable and confident when signposting patients to physiotherapy services, instead of offering surgical consultations. Surgeons revealed that they had learned through trial and error that this extra level of triage could help to delay or prevent *“consultant contact”* and essentially *“reduce their workload”* and the *“level of inappropriate referrals” (OBS notes site B gen)*. The lead physiotherapist in the department acted as a mentor and national figure for musculoskeletal disorders and was able to reinforce this decision and demonstrate success in the hospital. She described how her recognised status within the wider NHS context might have enabled her to be viewed as a



respected colleague at ‘*service redesign*’ meetings attended by orthopaedic surgeons. This contradicted, in her view, the professional and organisational norm that “*doctors talk to doctors and doctors listen to doctors*” (INT C 37012), although this explicit level of trust and respect across professional disciplines was not observed across all sites, or even consistently at site B.

In my observations, the process of prioritising, negotiating and juggling the demands of surgery and decision-making appeared to be fluid and temporal. Decisions tended to be made or led by the surgeon group or the surgeon in charge. The decision, and the group knowledge, were mobilised in the rest of the department. Despite this continuing presence, managerial knowledge and objects such as budgets and forecasts did not appear to be considered as important for decision-making by the surgeons in my study.

#### **5.4.7 Leading lights and opinion leaders**

In the same way that intra-group mentors were important for making decisions and establishing norms and standards within hospitals, national opinion leaders appeared to set precedents for acceptable knowledge for the wider orthopaedic community. Opinion leaders in the orthopaedic surgical specialty were surgeons who were nominated by their colleagues as educationally or professionally influential to practice. The selection of opinion leaders in my study was subjective and was determined by the surgeons themselves.

During my fieldwork, different individuals were quoted as legitimate providers of evidence. Examples of opinion leaders mentioned during observations included editors of prominent orthopaedic journals (site B), leaders of academic departments (site A) and Chairs of professional societies (Site C). Opinion leaders could also be historical figures who “*changed the face of surgery*”, for example John Charnley was used as a classic example of a surgeon who conducted a best practice approach to surgery that should be modelled within the group (*OBS notes site A gen*).

Where possible, I attempted to interview the so-called opinion leaders and leading lights. The consultant surgeon below describes his beliefs about being viewed as a leading light in the domain of orthopaedic surgery research:

*"He said, 'You just do PR, don't you, really?' and actually that's incredibly insightful. So it's the person that stands up and talks about the trials to the clinicians and then goes back and talks about the trial with the research team who actually make it happen. So it is very much about just being a link person. So ... and understanding across both sides is the most important thing but yes, there probably is an element of if you're the sort of person that is quite comfortable talking to those both groups really. It's PR. It's exactly it." (INT C 218008)*

This modest approach contradicted the views of this surgeon's colleagues who described his approach to work as *"amazing"* (OBS notes site A gen). The literature review demonstrated that opinion leaders can have a significant influence on the practice of professionals and subsequently on patient outcomes. What was interesting in the findings was the inconsistency in the apparent weight attached to the views of opinion leaders across the three sites. The consultant from site B quoted below recommended I seek the opinion of one leading light surgeon, whereas a different surgeon located at site C suggested I *"steer clear"* as his work could not be trusted. It appeared that this surgeon was concerned with the manufacturer-funded support the particular individual receives for his work.

*"But he's a very successful one, do you know (opinion leader name)? Oh fantastic, when I say strange man, like, he never sleeps apparently, he's like that. Yes, no, no he's amazingly productive but all his trainees, I've met a few, say he just never sleeps. I think initially he has about four hours sleep a night." (INT C 37010)*

It was not always obvious in what circumstances opinion leaders were likely to influence the practice of their peers. For example, in site A opinion leaders tended to stem from their association with large research programmes and progression in the field through their academic development. Reference to *"opinion leaders"* or *"showmen"* of the field sometimes varied, as their evidence and knowledge could be considered early adoption or false innovation and therefore not valid (OBS notes site A gen). This inconsistency is demonstrated in

the quotes below, the first surgeon describes his struggle with “*moving forward*” and then being “*singled out*” if a treatment goes wrong. The second describes how early adopters, who promote new techniques, face problems when national registry and trial evidence proves them to be inadequate:

*“Yes, and it’s a fine balance because you don’t want to stifle innovation because that’s what pushes everything forward but equally you don’t want everyone to jump on my bandwagon and something then turns out to be a disaster later on.” (INT C 198005)*

*...and then the initial adopters and the early innovators produce reports that are in uncontrolled setting that say this thing is a good thing to do, and then eventually the National Registry type data starts appearing and then the randomisation evidence appears and then use goes back down almost to baseline when everybody finds out that it was \*\*\*\*.” (INT C 218011)*

Attitudes across the groups regarding who was considered an opinion leader varied. Those surgeons labelled as influential to orthopaedic practice in one site (B) were considered “*arrogant charlatans*” in another site (C). As mentioned in the example earlier, even the recommendations of the Chair of the professional society was called into question by some of the surgeons. This appeared to be linked to the established norms of the group and what types of knowledge they privileged. My findings revealed the challenges that would be faced when attempting to select a group of opinion leaders who could lead the way and be a respected source of evidence for the majority of orthopaedic surgeons.

#### **5.4.8 Representatives from implant manufacturing companies**

The final category within this theme highlights the apparent authority that knowledge from the pharmaceutical and implant manufacturing sector holds within the orthopaedic departments. Manufacturers of orthopaedic implants have access to substantial amounts of funding to produce information to disseminate across hospitals. This appeared to influence the decision-making process of orthopaedic surgeons with regards to their choice of implants and procedures. The presence of these documents and promotional materials was widespread across all three hospitals, from displays on corridor walls to brochures left on the tables of the orthopaedic coffee lounges. There is always the potential that the simple presence of promotional material could

unconsciously bias the opinion of surgeons. However, they did also appear to overtly influence surgeon decision-making as I demonstrate in my field notes below. This conversation summary reveals a surgeon trying to convince the departmental manager to buy a new diagnostic test recommended in a brochure a representative had given him the previous day:

*"Surgeon to me: The thing I'm going to go and do after speaking to you now, is to go and speak to my manager to see if she'll let me buy a test for a patient.*

*-We walk to the managers' office together*

*Surgeon to manager: There's a test that's just become available, about a couple of months ago. It's been manufactured by (brand). Look here is the brochure. (Brand), this company, have just purchased another company which has produced a test that will tell you 98 percent accurate in every case! -Surgeon shows the brochure to the departmental manager.*

*Manager responds: But it costs a bomb. It's £500 a test, just for a test and they sell them in boxes of five. So it's £2500 for a little box of five tests.*

*The surgeon then gives his case for support: I've got a patient ... well a colleague of mine has got a patient and we're in exactly the situation. We've got to make a decision, because she's now four weeks after the operation.... five weeks after the operation.*

*- The manager said she would think about it and we leave.*

*Later that week the surgeon invited the manufacturer representative into the hospital to meet directly with his close colleagues to review the test. The manager did not attend or was not invited to this meeting." (OBS notes C/M site A)*

#### **5.4.8.1 Representative access to the surgeons**

There was variation in the access and acceptability of representatives from implant manufacturing companies across the three sites. For example, site A would only allow representatives into theatres who were from the company that was already contracted to supply their implants. This was stipulated in the terms and conditions of their contract with the implant manufacturer and was instilled by the management team and administrative staff who worked in theatres. The contract required that a representative was in the hospital every day and could be used as a source of evidence for surgeons and surgical staff regarding implant selection, as described in the quote below:

*"But it's just a representative and they are there to help and that's the idea. Yes and then what prosthesis go with what and how many of each of them there are so that they can check that they're in the cupboard. And, and yes so the reps are here." (INT A 218014)*

However, the senior nurse in charge of theatres later questioned their motivations for being on-site every day. He suggested that it was not to “help out”, but rather to monitor and check what equipment is being selected during surgery:

*“Yes we’ve gone with a company called (brand) now for all kits and because we’ve gone with that for feet all the way up to, to necks and the company have given us a massive discount. 40% discount if you use their kit and their kit alone. Oh that’s a bugbear isn’t it, their kit alone so they’ve got, so they then, they then put a representative almost in the hospital permanently. Who’s there to help out but you know damn well that they’re there to make sure that they are using your kit and if not we’ll be penalised. We haven’t yet. But yes.” (INT C 218013)*

From my observations, it became apparent that other company representatives that visited site A would have to go via the management team and procurement office prior to being granted access the surgeon group. The two quotes below illustrate how trying to limit access in this way was considered positive by the departmental manager. However, I noted that access was only restricted to controlled on-site admittance to theatres and not for meetings that took place outside the hospital department such as in the cafe, in the evenings or at conferences.

*“I get all the orders come through to me to sign off, if it’s something that I don’t recognise or I think I’m not paying, I’ll go back to the theatre’s team and say what’s this for. Because you know the reps come in and they’ll try and flog them anything you know; oh this is great and it’s all new, shiny and flashy. “Oh I want it, I want it” sort of thing, so its very much, we are really tight on who could go into theatre in terms of the reps, so very strict on the visitors policy.” (INT M 218014)*

When I asked her if the representatives try and work around the policy, she said:

*“No, they try but I usually find out somewhere along the line, but I think yeah, I usually find out one way or another. Somebody will tell me, they think that they’re going to get away with it and usually I catch up with them before it gets to where it needs to be. So like (surgeon name) would just use (brand) hip and knee replacement or resurfacing or something and it’s, I find out and ask, “what are you doing”; (and the surgeons ask) “how did you know?” or you know, sort of thing, like oh you need to come and discuss it, I’m not saying it won’t happen.” (INT M 218014)*

Site B and site C appeared to have no restrictions placed on the representatives' access to the orthopaedic offices and theatres. Site C did promote (via a sign on the door) that representatives would be seen by appointment only.

Observations at each hospital, including site A, revealed that representatives from multiple companies had access to surgeons, administrators and managers. These individuals were responsible for making decisions that could potentially impact upon patient care, particularly for the selection of implants. I observed representatives in theatre during operations, in pre- and post-operation preparation areas, in the implant storage room, hovering by corridors, staff coffee lounges and in shared office spaces. What was interesting to me was revealed in an interview with a theatre nurse quoted below. She stated that representatives would often compete over their "*patch*" to try to prevent colleagues from other companies gaining access to 'their' site. Together this demonstrates the strong commercial influence in the orthopaedic specialty.

*"Both are there. They come in very helpful; there's definitely 2 camps I think. We were heavily involved, well we weren't involved with (brand) we used a lot of (brand) products; we had no financial backing or support from (brand) at all – we used a lot of their products. And we didn't realise, I didn't realise until a few years later, why the reps weren't coming here, and people were saying, "This is my patch, get out"."* (INT C 37016 )

This lack of control over access of representatives to frontline delivery of orthopaedic surgery was an unanticipated finding at the start of the study. It was not a strong theme in the systematic review of literature (Grove et al, 2016). During the interviews, the surgeons would often suggest that they found the presence of the representatives helpful to decision-making. The quotes below came from consultant surgeons located across the hospital sites. They demonstrate the range of views regarding knowledge that originates from this source:

*"I had a go, I asked (surgeon colleague) to help me with the case, and you know, she had a huge defect but we thought we'd get away with it, and we didn't. And we were just scratching our heads and the rep for this was in theatre and he said, "I'll help you with that." Then you pay a bit more*

*attention because you've got a definite case, we've got a problem, and we looked at it and it's very impressive. And now we've done 3 of those; I've done 3 in the last sort of 18 months. (Other surgeon colleague) done one, so in that sense we're looking at new technology you know, every now and then, if you think there's a demand for it." (INT C 198001)*

*"There are some reps who are basically good in the sense that they make sure the kit you want is there. And other reps who effectively try and tell you what to do, which is irritating when you've been in a post 20-odd years, but that's probably the guy's characters. I think the reps can be very helpful to the nursing staff, because you know, when we started the (brand) was a stem, then you had a socket, you've got 2 sides to the socket, and effectively about 4 or 5 stems and that's what you need on the shelf. Nowadays, because everything's modular, even the primaries are modular, there's so much tackle and I think the reps can help the theatre staff a lot more than they can help us. Yes. I mean other ones, the ones you get on well with and they do a good job." (INT C 198003)*

#### **5.4.8.2 The influence of manufacturer knowledge on decision-making**

The extent to which the orthopaedic surgeons in my study were really influenced by the representative and materials supplied by companies, or how this evidence is weighed against other sources during decision-making, for example evidence from journal articles, is unclear from my case study data. It appears from the interviews that surgeons on the whole consider the representatives have limited influence on their practice. The consultant below was responsible for leading the single supplier project within his Trust. He describes the offers made by the company as "opaque" and states why he believes this evidence source lacks the transparency that is required to make decisions for orthopaedic services:

*"Transparency about price costing, because the costing not only involves what you pay for the prosthesis and to get it on the shelf, there are all sorts of other little sweeteners that manufacturers put into the equation like representative availability, servicing, free loan kits, there are all sorts of other little layers less quantifiable that would be introduced into the equation that will make it not a simple ABC decision and then when these decisions become opaque, they also become much more subject to interference by individuals who want to see their favoured brand prosthesis manufacturer on the shelf, and so you start justifying it by other sort of fringe benefits, if you like. So I think it becomes very difficult to make these decisions easily and transparency obviously is the only way to go forward, I think." (INT C 218003)*

Data from observations and interviews with administrators responsible for implant ordering, and managers responsible for procurement and payment of

implant invoices, would suggest that the representatives did have some influence on the surgeons' practice and decisions regarding implants. The quote below gives a narrative account of the close relationship between evidence from implant manufacturers, clinical decisions and practice. A manager explains the level of involvement of manufacturer representatives in his Trust with a recent example of a representative influencing the selection of an implant:

*"In theory, the way it has been working, up until recently at least, is pretty much – because nobody was really policing it – I could have gone and got you a rep from anywhere. Or a rep could have wandered into theatre, spoken to a surgeon directly, persuaded him that this is a piece of kit we want to trial, and the next thing you know two weeks later the rep's in, they're trialling this piece of kit. And then the consultant's saying, "Oh it's really good," and the rep says, "Yeah, it's the same price as what you've got now." So the consultant comes and, you know, bangs on somebody's door and says, "We need some of this, it's the same price as what you've got now," and then somebody's just gone – and this has happened – "That's fine, just use it." And that's when we find out we had a revision case that cost us £13,000 for the kit. Because nobody's actually checked how much this kit was going to cost (as opposed to just the implant). Because we know, for example, with that guy who had the £13,000 thing that actually... Because when the consultant found out he was actually mortified that he'd spent £13,000 and I don't think the rep... Yeah, the rep may no longer be with us if the consultant's got hold of him. But actually, having looked at the...(total cost) And he actually said in one... but he said in the meeting, he said, "Well if I'd have known that I'd have done it the old way that I was doing before, because, yes, it was nice but it wasn't thirteen grand nice." (INT M 37004)*

A theatre manager at site B reported a similar trend. However, she had taken steps to prevent it from happening in the future because of the wider impact that it had on the Trust and the fact that her *"job was on the line"*. She suggests that the only way to reduce representative influence was to stop paying their invoices (INT M 119014).

The managers and administrators were able to recognise some benefit in having representatives on site, particularly for complex surgery or during staff shortages as in the case below. However, perhaps appropriately, there always appeared to be some level of suspicion regarding their presence, for example the manager below asks the representative *"why are you here, really?"*:



*"The reps are here all the time. I'd say 90% of comfort for the staff, not so much for the consultant. If there is a lot of instance, I mean if you see a revision case, you know, sometimes it's complicated you know, it's like there's 20, 30 trays open. And it's complex surgery so I think that the rep's there for a reason. If the rep ... if a rep turned up and I asked him why he or she was here then ... and they said, "Oh he's doing two knees," I'd go, yeah but you know, they're primary knees, he's done hundreds so why are you here, really?. Well I think if I turned round to you and said I catch him every time, I'd be lying because I don't." (INT M 37002)*

#### **5.4.8.3 Surgeon beliefs about their relationships with representatives**

Manufacturers of orthopaedic implants employ a substantial workforce to ensure they have a presence in hospitals. They have significant budgets for marketing activities. It might be expected that surgeons develop relationships with the individual representatives. My study demonstrates that surgeon groups at each site had varying levels of relationship with the implant representatives. These ranged from an external outsider to long-term colleagues and close friends. These relationships were only discussed during interviews with staff who were not orthopaedic surgeons. For example, departmental managers explained the positive relationships some surgeons at sites B and C had. They revealed how surgeons *"like to work for"* particular companies and know the representatives *"personally"* (INT M 37005).

At site A, it appeared from my data that the influence of manufacturers had not been ruled out entirely. During my time at this Trust, multiple sponsored lunches and training sessions targeted at surgeon groups took place and seemed to be accepted as the norm within the specialty. My observations of theatre space revealed a strong presence of the allocated representative, who would often offer advice and recommendations about implants and kit to the surgeons and surgical staff.

It is important to note that there is a significant range of implants within one company's offering. Although site A was contractually restricted to using implants from one manufacturer, there was an opportunity, planned or not, to select implants, devices and kit from a wide range of price options. The implants used in all three sites ranged from relatively cheap well-evidenced and ODEP

10A rated devices, to expensive new hip replacements or surgical innovations that had not been formally tested and lacked long-term survival data.

Interviews conducted at site C revealed that representatives could be useful and add value to the information available to the department, and I observed surgeons and other clinical staff, particularly surgical nurses, seeking out their opinions during the planning and setting up of surgery. For example, they could *“access information about implants, combinations and their use without [us] having to go and look it up [for ourselves]” (OBS notes site C gen).*

At site B, the surgeons worked across two locations (B1 and B2). Because of this structure, each group of surgeons had their *“own representative”* of whom they appeared highly protective. They did not want to share access across the sites *(OBS notes site B gen)*. The contact with representatives appeared to be a source of conflict in site B, but was considered an important source of evidence without which the surgeon group could not function. For example, in one instance I observed a surgeon cancel a patient surgery because the representative could not be present *(OBS notes site B gen)*.

This entire theme is controversial and subjective, but very important for discussions about service delivery within the NHS. It might help to understand the varied use of different sources of information on which orthopaedic surgeons base their decisions when acquiring new implants, techniques and technologies. As described by the procurement manager earlier, transparency in the process appears to be lacking and this was observed across all three sites. However, evidentially, orthopaedic departments which have the highest awareness of implant usage data and ordering are in the best position to control what is used in practice.

#### **5.4.9 Evidence and explanations of the variation across groups**

This theme described the relationships between groups, how members of each group define their group boundaries and what knowledge is accepted within groups. The relationships can be explained by the theory of Legitimate

Peripheral Participation and Communities of Practice which were described in detail in Chapter 2.

My findings suggest that surgeons can enact LPP at any stage in their career, not just from the junior to senior level. This appeared to encourage the formation of a variety of CoP. For example, groups in this study were established through their physical location in site B, their surgical specialty in Site A i.e., hip surgeon versus hip revision surgeon, their level of academic interest in site C, and by their position within their organisation across all sites, as well as via their affiliation to professional societies as in site B1. This demonstrates that the intention of the individual surgeons to engage with a group and follow the group norms appeared to be configured through a process of becoming a full participant in the sociocultural practice of that group. According to CoP theory, if this process does not occur, the individual remains an outsider who does not have the relevant knowledge and skills to belong.

Across all sites, the departmental managers were outsiders because they did not possess the knowledge, skills, discretion and superiority of orthopaedic surgery which would have otherwise legitimised their belonging. Departmental managers I interviewed were all aware of their outsider status and their position outside the knowledge boundary, as presented in the quote below:

*“First of all we just don’t we just (a) don’t have the knowledge of, you know, all the information and things that we got and all the procurement stuff, so we don’t have the knowledge. And (b) I think the thing is, I don’t have the medical kind of experience”. (INT M 37005)*

They would often refer to themselves as *“not being clinical”* (INT M 37004). This phrase was continually used during interviews. It appeared to be a qualifying statement or defence mechanism for the managers’ decision-making and behaviour, rather than a positive difference in role type. For example, possessing managerial knowledge of the hospital and local network was essential for managerial as opposed to clinical decisions, but this was underplayed. Distinguishing themselves as not clinical demonstrates how the members of the surgeon group exerted power over membership of their group.

CoP literature predicts that existing members create the knowledge and group norms that make membership possible or not.

#### **5.4.9.1 *Developing meaning for the group***

Groups of surgeons appeared to have the power to renegotiate meaning and to construct new meanings for their group as circumstances changed. In site C, the ‘innovative insider surgeons’ became ‘outsider mavericks’ of practice when their newly introduced, yet unproven, implant technologies had negative outcomes for patients in subsequent years. It was important to understand the overarching group identity for each group, and how this related to surgeons’ knowledge and learning as a group.

Surgeons in site A negotiated their group identity and were keen to demonstrate that they performed evidence-based practice. They appeared to be responsible for defining the norms and characterising meaning for the group by implementing the findings of their own RCTs into their clinical practice. This message came across in many of the surgeon interviews I conducted in site A. The differences between group meanings were evident when I investigated the definition and meaning attached to EBM and the conduct of RCTs for surgeons working at sites A and C.

Through observation, I learned that site A took a “*pragmatic view of RCTs*” and implemented ‘what worked’ for their context (*OBS notes A gen*). This differed from the academic surgeon group in site C, who conducted research which was not directly transferable into their practice. Interestingly, the surgeons working in site C tended to define EBM as the use of ODEP rated implants in practice. This suggested a national view of evidence, rather than the contextual view which site A took. Although both groups suggested they practiced EBM, meanings differed and therefore the knowledge between the groups might not be easily mobilised. There was a variety of responses from the surgeon groups making a distinction between a “*pragmatic*” (*INT C 218008*), an “*evidence-based*” (*INT C 190004*) and a “*research attached to clinical work*” (*INT C 190003*) approach to practice.

#### **5.4.9.2 Central and periphery membership in groups**

The notion of centre and periphery membership in groups seems logical in theory. In practice, the groups I observed did not appear to have a tangible structure which could be designated as the periphery or the centre. For example, particular surgeons in the three sites did not physically sit on the periphery at group meetings. However, my observations of the discussions that took place in the hospitals revealed who were the core group members. It appeared that certain surgeons “*spoke more often*” and it looked as though their “*opinions were valued by others*” in the group, because they were not interrupted or argued against (*OBS notes site TPM*).

Group membership for the surgeons might not necessarily be defined by the position of the group members. This is because within orthopaedic surgery, knowledge is a closed domain and there is an objective amount of learning that needs to take place for someone to be called an orthopaedic surgeon.

Membership of the group evolved over time. In site A, a new consultant was able to learn the group norms to move from his position on the periphery to full participation as defined by other members. According to this surgeon, he had to actively take part in the trials that were under way at the hospital because he understood that this type of work was important to the group.

This process of learning the principles of EBM appeared to allow this surgeon to gain access to a group by developing knowledge, understanding and involvement in RCTs. He was aware of the specific meanings and group norms that helped to define the group as a standalone and bounded community of practitioners which required members to conduct RCTs within their practice.

#### **5.4.10 CoP use of knowledge for decision-making**

The literature described in Chapter 2 suggests that communities form so that knowledge can be exchanged between group members. The surgeon group at site A had recently decided to change the method of fixing an orthopaedic implant based on the results of one of its key members’ clinical trials. According to conversations with the surgeons, this did not involve changes to the clinical pathway or involvement of the management team. Instead, as a community they

decided to perform a technique in a different way, and then enacted that decision. This change in practice was acceptable within the community because the group had a shared understanding of what the results of the RCTs meant for practice.

In addition to professional clinical education and training, I observed various knowledge skills that appeared to be important for a wider definition of professional orthopaedic practice. They included the technical skills of surgery, i.e., how to perform a hip replacement, but also implicit knowledge that enabled surgeons to function within the hospital organisation that has rules, processes and professional hierarchies.

However, knowing what knowledge is accepted might become problematic when the epistemic cultures between different groups and different hospitals do not align. Time spent at the three hospitals revealed that the surgeons at site A appeared to learn, share and produce knowledge related to EBM, whereas surgeons in site B seemed to focus on operational efficiency and throughput. The surgeons at site B tended to emphasise learning and knowledge production to make their theatres and surgical list planning more efficient. This knowledge was grounded in evidence from the group's practice and examination of data at the hospital level, not from academic institutions and multi-centre RCTs.

Across the three sites, I sought to understand how knowledge and evidence was produced through negotiation amongst surgical colleagues. Over time, it appeared that some surgeons regarded evidence as the best way to do things in their context (site C). Others privileged knowledge produced over time, as the group solved problems of orthopaedic practice through clinical trials (site A). Surgeons at site B appeared to concentrate their efforts on improving service provision, efficiency and local learning, for example they created a triage service and had a project underway to improve the post-surgery pathway. These types of improvement activity were not observed in the other hospitals to the same extent. In all three sites, group norms appeared to mutually reinforce the 'correct' sources of evidence, knowledge, interaction and experiences for the

group. These patterns of behaviour varied considerably and reflect manifestations of the underlying systems of meaning and practice held by each of the CoP.

#### **5.4.10.1 Sustaining CoP and membership to groups**

CoP consist of, and depend on, the membership of its members to survive.

What was important for the surgeon groups was that once the CoP was established in their hospital, its members were responsible for continually reproducing it in order to prevent it from disappearing. This was particularly apparent in site C, where surgeons would often not make important group decisions without consultation with their peers at the team meeting (*OBS notes site C gen*).

Within each hospital, more than one CoP existed, and it became obvious over the course of the observation and studying as to which surgeons belonged to which group. For example, at site A two CoPs had evolved, one senior member of a CoP would openly mock the '*leader*' and the principles of the other. Junior surgeons in site B reported feeling uncomfortable when they worked alongside surgeons from the other CoP. The distinction in this group was a strong reporting hierarchy as the norm, compared to a flatter structure in the opposing CoP. The surgeon quoted below commented on the accepted personality styles and behaviours within one CoP:

*"A couple of personalities that you think, you know maybe not, yes. There are the three specialists and maybe one of them I would choose not to go to whereas the other two I wouldn't have a problem with at all but other than that I still wouldn't, you know, he's a good surgeon. It's just his personality. But everybody throws their toys out the pram at some point". (INT C 31013)*

#### **5.4.10.2 Outsiders and movement within CoP**

Across all the CoP that I observed, the members of the group appeared to create the norms that had to be learned and accepted by outsiders to establish their legitimate access. For example, in site A, these norms were an interest in EBM and the application of research in clinical practice. Surgeons were aware of the requirements for membership and strived to become insiders.

There were strong goals for the learners who sat on the periphery, as they had to develop an initial view of what each CoP stood for and what could be gained by joining. On the other hand, it appeared that an awareness of what knowledge needed to be learned could discourage some surgeons from aligning to a CoP and inspired them to look elsewhere. In the case below, a surgeon focused her efforts on medical education to legitimise herself with another respectable group within the department, using her phrase she *“got to sell myself as teaching”*:

*“But this was the perfect job, because I’m not researchy at all. I was always told that would be a bad thing. No, when you sell yourself as a consultant, you’ve got to sell yourself as something... so I got to sell myself as teaching. I love it, it’s good.” (INT C 218005)*

According to the literature, the aim of any outsider of a CoP is to become a respected group member who then has authority within the group. In my study, it appeared that the surgeons achieved this through a process of legitimate peripherality which involved them learning through participation, immersing themselves in the norms and culture of the clinical practice of the hospital.

Group norms and accepted knowledge can change over time as different individuals move from the periphery to the centre. New knowledge is allowed to move into the group and old knowledge decreases and becomes less important, as is the case with the increasing importance attached to NICE guidance.

Knowledge was important in becoming part of the CoP, but a greater appreciation of the values of participation in the community appeared to develop from the surgeon becoming a part of the group.

During the observations, I sensed that the surgeons attempted to maintain a strong sense of individuality, but that this was coupled with a need to feel part of a powerful clinical group. During my period of data collection I did not encounter any surgeon who actively wanted to be a lone worker, on the outside of their community. The surgeons appeared to gain personal and professional advantages from group membership.



In interviews, surgeons revealed that they would commit time and effort, and be willing to take more responsibility for their group tasks. As their membership roles increased, it appeared that they were able to achieve a greater sense of identity within the group. My findings suggest that the development of surgeon group identity was intrinsically linked to career pathways, and their ability to succeed within the wider profession. There was an inherent importance attached to being on the inside of a CoP; the sense of membership was essential.

#### ***5.4.10.3 Variation from CoP***

A key feature was that learning within CoP was situated, i.e., context-dependent. Knowledge and evidence could not be considered in isolation, manipulated in subjective terms or analysed as separate from the social relationships that occurred within the three hospitals. The use of evidence and the variation that played out between the groups needs to be considered in the context of the group situation. Therefore, learning and knowledge was a characteristic of the community within which it developed. This might help to explain why the CoP in each hospital appeared to demonstrate different behaviours, practices and methods for decision-making in hip replacement.

Each CoP could be viewed as providing the surgeon group with an intrinsic condition for the existence of their knowledge. In essence, it enabled the individuals and groups to distinguish what they did as correct and made sense for them. Training was a way of connecting with the traditional established practice of the other surgeons in the hospital and participating in the social life of the CoP. Groups of surgeons appeared to share an understanding of what they were doing and what that meant for their practice and for their communities. This understanding and meaning varied between my case studies and will be likely to be different in different hospitals, cities, regions or countries. The variation I observed might not be considered 'right' or 'wrong', but instead reflected norms for each CoP.

### **5.5 Cross-case analysis: Groups**

The three hospital sites varied in the group-level factors across their different CoP, as shown in Table 11.

**Table 11. Overview of the group level factors by hospital**

<b>Theme features</b>	<b>Site A</b>	<b>Site B</b>	<b>Site C</b>
Characteristics and professional norms	<i>EBM and innovation</i>	<i>Quality improvement, efficiency and financial savings</i>	<i>Group decision making and sharing local best practice</i>
Professional societies and networks	<i>Strong influence of clinical academic institutions in the field who conduct research</i>	<i>Professional societies, in particular the BOA</i>	<i>Professional societies, particularly the specialist hip societies</i>
Situational learning and mentors	<i>Learning was through the academic training programme that all juniors underwent to some extent. Mentors were the Principle Investigators of the trials at the site</i>	<i>Learning differed across the sites and juniors had to get used to the different methods and systems across the sites, plus the differing personality styles in each group</i>	<i>Learning through doing 'what we do'. Traditional apprenticeship-style training to establish the local practice of the site</i>
Leading lights and opinion leaders	<i>Strong influence of clinical academic leaders who conduct and publish high quality research</i>	<i>Editors of leading orthopaedic journals and chair of the BOA</i>	<i>Chairs of the professional society and local opinion leaders</i>
Representatives from implant manufacturing companies	<i>Present but controlled. One company representative at all times</i>	<i>Mixed across sites. Access was allowed but attempts by management to control it</i>	<i>Open access, no restriction placed on groups in terms of company access or implant selection</i>
Legitimate peripheral participation	<i>Based around education and training in EBM and involvement in research under way at the site</i>	<i>Linked to each location. However, there was a strong professional hierarchy at both sites, hence time in post was associated to participation in the groups</i>	<i>Constructed through the 'old boys' network. Only surgeons who aligned to and followed the norms were allowed into the group</i>
CoP	<i>Two: one intrinsically linked to pragmatic EBM, the other focused on innovation and driving the specialty forward</i>	<i>Two: Conflicting across sites with distinct norms in each</i>	<i>One, strong group within senior surgeons. Tight group norms focused on teamwork and sharing</i>

## **5.6 Summary of the theme**

The key message in this theme is that the decision-making and behaviour of orthopaedic professionals was inherently linked, and conceivably governed by their group membership. The distinct groups I observed resulted from different behavioural and procedural incentives or motivators enacted at each of the three sites. These incentives included recognising the importance of research in practice, the weight attached to implant manufacturer representatives, maintaining a physical position within a set location, improving separated services, and upholding the strong bonds and relationships between colleagues to ensure effective function.

Decision-making and practice were also governed by the norms within the orthopaedic surgeon profession as a whole. These wider norms created a sense of standard practice for all orthopaedic surgeons. However, local group norms appeared to be essential in driving routine behaviour at each hospital.

Determining what it means to be an orthopaedic surgeon at each of the different sites A, B and C was essential for my study. The inherent granularity between groups of surgeons might produce variation in practice when each is compared to the entire profession. While we may depend on the general professional norms of orthopaedics to constrain some deviant decision-making behaviour, the findings presented in this theme imply that this is not always the case.

Membership of professional bodies did not appear to be able to ensure the success of established ideals such as the practice of EBM.

The BOA states that their membership supports orthopaedic surgeons to focus on excellence through professional practice, training, education and research. The findings presented here have suggested that it is the individual community of practitioners which decides which of these aims, if any, they emphasise in their practice. My findings suggest that even highly professionalised individuals may make decisions based on their own egocentric motives rather than by the standards of their professional group.

However, orthopaedic surgeons on the whole did not appear to want to deviate

from their group norms and felt uncomfortable doing so. Whether the recommendations from external organisations such as NICE aligned to the group norms seemed largely irrelevant in the day-to-day practice of orthopaedic surgery. Instead, group membership and alignment of practice to the norms of the other members of their group were vitally important.

In the last chapter I described different individual characteristics. In this chapter, I found that these were subsumed by the importance of the characteristics of the groups, the LPP and the CoP, and a sense of belonging. In the next chapter, I investigate orthopaedic surgical practice at the next level – the organisational level.

## **6 Results 3: Knowledge, Capacity and Contingency in Organisations**

### **6.1 Introduction**

This theme reflects the organisational and operational issues including the contingencies and constraints in the sites which could act as a source of variation in the decisions made within the hospitals, and that acted upon the three organisations. These issues represent an important component of clinical decision-making within orthopaedics as they underpinned the routines and capabilities of practice at each site, i.e., the scope of work conducted. Contingencies and constraints included the financial status of the hospital, pressure to reduce costs, staffing issues, service planning e.g., in theatres, and the need to improve hospital processes. The external constraints that act at the national level also appeared to be a significant influencer on practice, such as the large-scale efficiency savings. These are described in the next results chapter (Chapter 7).

Of particular importance for the organisational level of analysis was the influence of different professional hierarchies, and the extent to which individuals working in each hospital were socialised into the norms of the organisation. In this section, I will use examples to highlight how the organisational culture, and capacity for knowledge and evidence sharing, influenced the practice of orthopaedic surgery and clinical decision-making across the three hospitals.

### **6.2 Defining concepts and determining meaning for this chapter**

Reports from the three hospitals and distinct professional groups in my study (the managers, clinicians and non-clinical administrators) illustrate the significance of the assumed definition of 'evidence' and the use of evidence in orthopaedics. There was a mismatch in meanings around this concept. It was a source of misunderstanding and sometimes conflict among participants and professional groups in the three organisations. 'Evidence' and 'guidelines' in the

organisation, and who was considered to be the 'manager' or 'governing body', were the concept definitions which varied most across and within the sites. During the interviews, I attempted to clarify the understanding of participants regarding the concept being used.

'Evidence' in health and 'knowledge mobilisation' are contested concepts, as illustrated and discussed in the literature review (Chapters 2). Their meanings varied across time and location. This was certainly the case in my findings which revealed that 'evidence' could encompass everything from personal experience and legacy routines within the hospital, to guidelines produced by NICE. The meanings attached to the term 'guidelines' were equally ambiguous as they depended on whose guidelines, and therefore whose knowledge was privileged by the organisation and its workforce. Throughout my empirical work, reference was made to NICE guidelines, guidelines from professional societies such as the BOA, internal hospital guidelines and specific orthopaedic department guidelines. Definitions of the 'manager' and 'governing body' appeared to differ according to the cultural norms of the hospital. They ultimately reflected who appeared to be responsible for decision-making, contingent upon which individual(s) or organisation held the position of power within each Trust. This power and control could also reside outside the hospital, for example with the local CCG.

This variability in concepts and meanings reflected some of the implicit assumptions which represent the organisational knowledge present in each hospital case study. Within each site, these assumptions consisted of the level of organisational knowledge of staff, their position within the hospital, and the legacy knowledge which appeared to belong to the organisation rather than to the people who worked there. Organisational knowledge appeared to reflect knowledge of 'the way we do things around here' and appeared to have substantial sticking power within the Trusts. This type of knowledge replicated shared customs and systems of the hospital staff which could be accessed when attempting to make sense of organisational functions, to understand situations and circumstances in similar and characteristic ways.

### **6.3 Hospital strategy, external demands and environmental pressures**

During the whole period of data collection, it was difficult to examine organisational knowledge. The processes at work were highly complex and changeable. The three hospital cases appeared to construct and use organisational knowledge in a variety of ways. The approach they chose depended on which type of organisational knowledge was privileged, how the Trusts defined strategy, and the methods (if any) they used to perform knowledge mobilisation. The three hospital strategies differed in their organisational focus, from personalisation of care, to innovation, and sustainability for the future:

*“Provide safe, effective and personalised care*

*Improve the quality of care through innovation to deliver improved services*

*To make a difference so that services are appropriate in the future”*

*(Doc analysing Strategy A B C. NB the exact text was changed to protect hospital identity)*

Through observations of day-to-day practice at the three hospitals, it became apparent which type of organisational knowledge tended to be privileged. Site A appeared to emphasise biomedical and clinical research knowledge and therefore aligned organisational processes towards EBM and best practice. Site B concentrated its efforts on improving the hospital processes and achieving efficiency and cost savings. Site B appeared to favour managerial knowledge and focused efforts on the achievement of organisational outcomes, e.g., reducing their financial deficit. Site C seemed to be motivated by the attainment of government targets and quality standards set out by national bodies including NICE. However, the clinical staff differed at site C as they appeared to privilege knowledge of best practice at a more concentrated local rather than national level. This comparison can be seen in the two interview excerpts below, the surgeon at site A states that *“research as intricately related”* to work, whereas the

surgeon from site C revealed that work to map local services needed to be conducted before NICE guidance could be tackled:

*“Then they (the board) see research as intricately related to what they want to do and that’s partly because it helps improve patient outcomes and save money sometimes with cost effectiveness and stuff and partly because research, this whole prestige thing, so university hospital needs to be doing ...” (INT C 218008)*

*“And so I was sort of working on the governance plan, so half the role was that and then half of it was working on NICE guidance. But it soon became clear that there was just so much work to do around NICE in terms of just mapping local services. Services were so different, you know, just a few miles down the road, that just having a sense of whether we’re compliant or not compared to others was a massive undertaking.” (INT M 19009)*

The strategy and processes in the three organisations were prone to change depending on the external demands, institutional pressures and environmental incentives acting on the organisation. The presence of an organisational strategy did not appear to guarantee that it would be used, or that it could replace the entrenched organisational knowledge. This might be because the latter guided everyday decision-making within the sites, and the two existed in parallel.

An organisation can be defined as having an *“articulated purpose”* which has an *“established mechanism”* to achieve (Miles et al, 1978). In other words, an organisation states what it wants to be through its vision or mission statement, and what it will do to get there. Healthcare organisations located within the UK public sector differ slightly, because the organisation and those in charge may not always be responsible for establishing the articulated purpose or goals. Instead local or national policy-makers, governing bodies, or even the public, may directly or indirectly set the goals. The three hospitals in this study appeared to be engaged in an ongoing process of questioning, verifying and redefining their purpose, depending on the external demands being placed on them by others. These others extended from middle management right up to government level decision-makers. The staff at each of the organisations had to constantly modify and refine their structures and processes to meet the requests set by others. Sometimes staff had a sufficient notice period to make changes, as



in the case below when the local CCG decided to align payment structures to NICE quality standards:

*"At the time, probably three years ago when it was all kicking off, I went round quite a number of bits of the organisation and said, "any minute now we're going to have to really, really demonstrate that we're compliant with NICE Quality Standards because we won't get any money if we don't."*  
(INT M 37003)

More often, I observed an impending change happen with little notice. This appeared to be due to environmental pressures acting on the hospital. During my period of observation at Site A, the organisation had to cancel or relocate all elective operations to meet the increased demand for emergency treatments. This was not part of their organisational strategy, and was not usual practice. At the time it caused a lot of upheaval for the orthopaedic department who had scheduled services for the coming weeks. The external environmental pressures acting on the hospital were an unfortunate consequence of increased demand, which could not be met with the existing resources of the hospital. Circumstances like this had to be reported to NHS England in daily situation reports, and staff reported these as a source of external pressure for the organisation. The guidance for completing the reports state that:

*"Delaying ambulances outside A&E as a result of a temporary mismatch between A&E/hospital capacity and numbers of elective/emergency patients arriving is not acceptable, and that hospitals should implement escalation plans including cancelling routine operations."*  
(Doc analy DSIT Guidance 2015)

In addition to this, the orthopaedic departments had to report on the number of cancelled elective operations each day and within a 24-hour period. This was problematic for the departmental managers who described constantly *"juggling everything... from staff and theatres...to patients"* to meet the ideal target of zero cancellations (OBS notes site B). The department manager (site B) provided an insightful description of the added pressure within the departments which stemmed from the financial penalties of cancellations. It reveals how clinical activity has to be weighed up and balanced against the risk of being *"fined"*:

*"I'm going to go, "Okay." You know, "You just phone me and say, 'Look, this patient didn't stop their stuff (anti-coagulants), I'm cancelling the case'." Fine. You know, and then there was somebody else said, "Well they could have proceeded with that, we will be fined" the last thing anybody should be put in a position is where they're being challenged around their clinical practice by somebody who is not clinical and also feeling under pressure to do something they're not comfortable with, because if that goes...I've already said it, if that goes wrong I'll get a rap on the knuckles for it." (INT M 37004)*

### **6.3.1 Organisational contingencies in orthopaedic services**

There was a constant struggle to achieve a balance in service delivery, whether that was balancing clinical and managerial needs or balancing financial pressure with the resources available. This balancing appeared to be an ongoing task across hospitals, not just the result of particularly busy periods.

### **6.3.2 Internal pressure and external intervention**

The dynamic process of adjusting to external environmental pressures and uncertainty, whilst managing the internal institutional interdependencies was complex and required more than organisational knowledge to resolve. Contingent pressures were clearly present in the language used during meetings within the hospitals, as highlighted in the field note below:

*"Terms such as "firefighting" and having "reactive services" were used in the management meeting to describe the process of decision-making." (OBS notes CCG site 3).*

Sometimes the unscientific approach of "*suck it and see*" was taken when decision-makers decided to try something new to discover whether it might be successful (*OBS notes site C gen*). Although this contradicts the goals of EBM, it appeared that sometimes the practice-based knowledge of 'what works' or 'what might work' was all that was available to the decision-makers because of the complexity of the context. In the delivery of orthopaedic services across the three sites, I observed countless instances of decision-making when tangible evidence and knowledge appeared to be absent. A senior manager describes this flexible approach below, and uses the phrase "*well you can do it if you want*" in relation to NICE guidelines:

*"Yeah, I mean, we just have a table of... a table against the recommendations and they just say, "We do do this, we don't do that." We don't have a heavy follow-up 'culture', if you like, in terms of whether they're going to do these things or not. Yeah. But when you just say, "Well you can do it if you want," it adds to the evidence 'library', if you like, doesn't it, but – what it means?, yeah." (INT M 37003)*

However, not all staff found such a flexible environment easy to work in. A senior nurse described to me the difficulty he had planning services without sufficient *"quality data"* to make decisions about a new service (INT C 37016).

Across the three sites it was important to examine the complexities of adjusting to the internal pressures of external intervention, for example the release of a new piece of NICE guidance. I searched for patterns in the behaviour of the organisation and the workforce, such as how knowledge was spread or not spread. The movement of knowledge appeared to be particularly problematic. For example, guidance would come directly from NICE through update emails to named individuals in each site; however, who they were directed to and whether they were read and actioned was locally dependent (OBS notes site B gen). The quote below describes the non-spread of NICE guidelines in site B. This manager provides various explanations as to why knowledge mobilisation failed to occur, including, a lack of awareness, insufficient reporting processes, lack of follow up and retroactive planning for change. He refers to these in the quote as *"blockers to implementation"*:

*"You know, where is this information sent to, because, you know, governance leads are great but they're clinicians and, you know, they do have other jobs to do and, you know, it might not necessarily always be the top thing on their priority... So that's another blocker to implementation, who are you sending the guidelines to?... I think there are more black holes like this here. It feels like communication seems to stop somewhere... "What, there are NICE guidelines? No, I know nothing about them." That's an organisational issue." (INT M 37004)*

### **6.3.3 Financial pressures in orthopaedics**

One of the most powerful contingent variables found across all three hospitals during my data collection was the apparent influence of limited organisational finances. This was coupled with the expanding cost of, and demand for, orthopaedic services in the NHS. This issue has been recognised as a national

problem for the UK, as indicated in the abstract from a BOA report released during my empirical work. It proposed that orthopaedics services are in a “perfect storm” as “demand will continue to outstrip supply”:

*“Orthopaedic referrals from GPs to secondary care providers are increasing by 7-8% per annum and show no signs of slowing... trauma and orthopaedic surgeons make up 33% of the surgical workforce and are responsible for 25% (rising towards 26%) of all surgical interventions, and further demand will increase this... It is likely that the number of hospitals that are financially challenged will increase. We are in a ‘perfect storm’ of ever rising demand and financial austerity.”*  
(Doc anlay BOA 2015)

Hospitals were attempting to address this financial austerity. Every site I visited was in some stage of a ‘rationalisation process’ or ‘cost improvement scheme’, in which the orthopaedic departments were expected to reduce the cost of service delivery whilst maintaining clinical quality. Orthopaedics is one of the most expensive surgical specialties, alongside cardiothoracic surgery, in the NHS and has the highest number of consultant surgeons working in England (RCS, 2014). The rationalisation of services appeared to be one solution to the supply and demand problem.

My observations revealed that rationalisation was mainly achieved through the renegotiation of orthopaedic implant contracts (site A and B) but it did include some efficiency savings (site B), and service redesign activity (site B and C). Contingency theory is useful in helping to demonstrate some of the associations that were found between these structural and contextual variables. In site C, the management decided to close protected elective orthopaedic theatres (structural) to streamline costs across the organisation (contextual) in order to meet the financial restrictions established by Government (*OBS notes site C gen*).

However, contingency theory is unable to explain all the causal connections between the observed context, structure and behavioural relationships discovered in my findings. It could not be used to determine whether a rationalisation plan to achieve financial savings would work, or whether the approach taken by site A, B or C was superior. The two hospitals that had

completed the implant rationalisation process (A and B) were able to provide me with estimates of how much the department or Trust had saved through their improvement programmes. Managers working at various levels within the two hospitals appear to suggest that relatively large savings ranging from 60k to 500k had been made through rationalisation activities. However, these figures were not necessarily tangible savings in real terms which could be invested back into the Trusts (*INT M 37004*).

#### **6.3.4 Variation in contingent factors**

The variation in approaches suggests that there is no one best way to manage an organisation and achieve success. This is particularly salient in healthcare where no two organisations are the same. The three sites I examined had overtly different approaches in how they functioned as organisations. At site A there was a strong managerial presence across the orthopaedic department and surgeons were under the assumed control of the hospital executive and clinical director (CD). Reference was made by all professional groups to having to check or getting things “*signed off*” by the CD (*OBS notes site A gen*).

Site B operated as two separate institutions (B1 and B2) with different organisational rules and norms. Even the manager responsible for both departments perceived a lack of control over the department where he was not physically located. Instead, the clinical lead or the most senior surgeon appeared to take on the role of manager at each site (*OBS notes site B gen*). Similarly, site C appeared to function as a standalone department within a wider organisation. The orthopaedic department here was essentially in a separate block of the hospital, and management was based elsewhere on site. I observed that this physical distance contributed to the two professional groups not interacting (*OBS notes site C gen*).

Findings suggest that the conditional relationships between the different contingent elements of the organisation and how these fitted together within the organisational structures and the external environment were important for the success or failure of the hospital. Success appeared to be the attainment of various targets that were mandated and monitored by Government. These may

not necessarily include recommendations for services, such as those included in NICE guidelines. What worked for each of the three hospitals appeared to be dependent on their practice context.

#### **6.3.5 Processes of organisational change**

Across the three sites, it was clear that the organisational contingencies had different influences across the varied organisational contexts. Examining them as an outsider provided insight and understanding of the levers for change at each site. For example, one hospital was able to implement the new clinical guidance for hip replacement because they had already made necessary changes to routine practice through research and established protocols (site A), whereas others appeared to struggle to make notable progress because guidelines had not been sent to, or appraised by, the department manager (site B), or had only achieved partial implementation due to the apparently different priorities and jurisdiction of management and clinical staff (site C).

My interviews and observations revealed that the three organisations had significantly different views and processes for implementing, monitoring and governing NICE guidelines. These differences might have contributed to the variation in the decision-making practices for hip replacement across the sites. I have included three detailed descriptions of the guideline implementation processes in Table 12 to demonstrate how this variation played out in practice.

**Table 12. Variation in NICE guideline implementation processes**

Case study hospital	NICE implementation processes
A (INT A 218015)	<i>"We started monitoring NICE implementation in the trust in 2011, and then the group wasn't called (name) Group at that time, I'm guessing but I think we must have started around 2012, but I'm not exactly sure about that. But as part of us taking on that project of monitoring NICE guidance implementation then a group was formed from a colleague of mine who's now left. Okay, so, when NICE issues their guidance, they issue it on a monthly basis, so it's always the fourth Wednesday of the month. I've gone to the website, check what new guidance is issued, and I forward a list of that guidance to (name) who's the chair of (name) Group, and (chair name) will send those out. He will look at the guidance as a clinician, for him, then, it's easy for him to decide which specialty, perhaps, he might, you know, colleagues will know who to send it to, and he'll send it out to a relevant lead. TA's that's technology appraisals, go to (name). She's our high cost drugs pharmacist. So they're dealt with through pharmacy then, because TAs are pretty much always around high cost drugs, normally, cancer, cancer drugs. So (name) deals with those and (chair name) deals with all of the ... all other the types of guidance. So they'll be sent out to a lead who then we hope will come back and say, yes, I'll have a look at it. I mean, depending on which it is. I mean, if it's a clinical guideline, public health guidance or quality standard, there's recommendations in there, and normally a form of a baseline assessment with the recommendations in. It makes it easier for them to fill out and, sort of, indicate if we're compliant or not."</i>
B (INT A 119009)	<i>"It's kind of grown and changed over the years so... We have the NICE meeting which is bi-monthly. Any new guidance that has come out, there has to be some kind of response. Well there was some new guidance this time, the medicines optimisation is new guidance. What the process is, is that when you guidance comes out and this group says that it's relevant then we send out a questionnaire to each of the directorates. So I send this out to the General Manager and then they will send it to the most appropriate person in that directorate. Now, this is one of the processes that I'm saying that we've changed over the years. Because in the early days we'd have a group and we'd meet and we'd discuss if we were compliant and what needed to happen; what we do now is send this questionnaire out, and we've made it as user-friendly as possible so everything... I don't know whether I've got one that I might be able to show you. We've made it user-friendly so that all they have to do is tick 'Yes' and 'No'."</i>
C (INT A 198002)	<i>"Right, so I think probably this standard operating procedure would explain things fairly well. Horizon scanning, I mean, that basically is getting it from the NICE website, the pre-releases, and also the commissioner sends things through but the NICE website is always up to date. I actually work from the NICE website so that's where I get the new releases, but I understand they do actually email my colleague with new releases and from that she disseminates them. So I very much still work from the website and don't rely on emails that may or may not come from NICE or the commissioner. So once I get an email, then I email the clinical director of the care group that it applies to. I mean, some of it is a bit trial and error. I contact those people to ask, you know, say, for example, it's a Gynae piece of guidance, well, I would know that but if I didn't know that I would contact the CD for Obs and Gynae and ask them to nominate a lead for that piece of guidance. And I just ask them to complete that (audit)... So whether or not they meet the standard or they're working towards it, evidence and that comes in the form of local guidelines or just saying what they do, and then we encourage them to write their own action plan and this is what they're not very good at doing"</i>

However, I found conflict in the data. The processes described in Table 12 differed compared to the practice I actually observed in the organisations. It appeared that the processes attached to NICE guidelines and governance sat with managerial and administrative staff, not with clinical staff. Notes from my observation at site C show this conflict, demonstrating that clinical staff had “never seen” the organisation’s NICE process:

*“It (NICE) was rarely noted as an influential factor in the day-to-day activities of surgeons, clinical and non-clinical staff working on the wards. Staff I spoke to were unaware that their hospital Trust had a NICE process unless they were directly involved with it. Often in conversation people would say things like “do we have one?” (a process) “I’ve never seen it”. This was concerning as it appears that a lot of time and effort goes into the development and maintenance of these processes at the Trusts.” (OBS notes site C gen)*

This example of NICE guideline and guidance implementation typifies organisational change in my study. The three hospitals differed in their approach to change and this was contingent upon their social environment (who held power to make a change), their structures, (did they have the resources and capacity to change) and the attitudes and behaviour of the members of staff involved (did they believe in it and were they expected to change). This emphasis on organisational capacity was described in detail in Chapter 6, when I introduced the concept of absorptive capacity (ACAP) of organisations.

#### **6.4 Organisational capacity to implement change to mobilise knowledge**

As described in the literature review, an organisation is likely to succeed at knowledge mobilisation when the capacity of their internal structures, attitudes and behaviours align to the demands of the environment, and hence can flex and adapt when required. However, this notion assumes that the organisation is designed to meet its needs, and that the management style and structure is appropriate to both the tasks undertaken and the culture of the staff who work there. In other words, does the organisation have the ACAP for change, and for the mobilisation and implementation of knowledge including clinical guidelines. This fit between design and delivery was not always apparent in the hospitals I



observed. The organisations, their physical layout, staffing and service designs had evolved over time and did not always appear optimal. The clinician quoted below demonstrates how the lack of “*senior staff in A&E*” restricted adherence to guidelines in site B:

*“So this one, nerve block. They want everybody to give nerve block when they come to A&E. That doesn’t happen all the time but they are expecting everybody to have it. But if you don’t have some senior staff to do it downstairs in A&E then you won’t be able to do it but most of them and one of the things we mainly changed was we were doing the uncemented hemiarthroplasty before. The NICE guideline was to put a cemented stem in; and that’s debatable here. So NICE, I don’t know how they came up with the idea to say, “You need to cement all of them”.” (INT C 37016)*

External demands and environmental incentives, such as the implementation of new guidelines, compete for and with the internal institutional pressures and targets. I observed these pressures within each of the Trusts and they appeared to reflect the sub-systems within the hospitals. Examples included how the clinical departments or wards differed in their complexity, their specialisation of tasks and the creation of functional roles, teams and procedures within the organisations. A surgeon described “*frustration*” over the internal issue of bed space. He states that it impacted on patient care in his Trust because in the end, out of the “*2 cases [that day] we did the least important of the two*” (INT C198005).

#### **6.4.1 The physical and structural capacity for knowledge mobilisation in hospitals**

Physical capacity of the hospital in site B appeared to influence variation in service delivery for this Trust. Sites B1’s orthopaedic wards were split across two floors and were treated as independent entities with their own scaled-down organisational knowledge. This was in addition to the organisational knowledge held at site B2, as the ward was a completely distinct unit (*OBS notes site B gen*). All three wards were essentially part of the same organisation (site B). It might be expected that they would work towards the same goals, using the same processes. However, I observed that each of the wards had their own staffing, procedures and intangible ways of working, i.e., their own organisational knowledge and processes for mobilisation. The observation extract below reveals the difficulty staff found in viewing the organisation as a whole:

*"I shadowed a physiotherapist (physio) who specialises in the recovery of patients with hip replacement at site B1. She talked and walked me through the layout of the hospitals and the organisational structure spilt across the sites. She referred to the physios at site B2 as "them". The organisational chart showed the physios working across both sites interchangeably as one clinical group but they did not do this in practice. Site B1 physios even stuck to "their floors" because they knew what they had to do (the organisational processes) of each floor. She mentioned that it was difficult to mix the physios across the two sites because most of them didn't know or even recognise the surgeons working at the other sites so couldn't easily interact with them. Sticking to "their floors" meant that they knew what to do and who to speak to for information when they had an issue. Knowing "my role" and feeling comfortable speaking to "my consultants" outweighed this physio's desire to work across both sites. Hence it made the service delivery easier for the individual. It appeared that this unwritten rule was accepted as the norm by all of the physios in site B, as I never saw any site B1 physios working at Site B2 and vice versa." (OBS note site B1 gen)*

Across all three sites, I found differences in the processes of decision-making, the level of information that was shared across the organisation from senior management to front-line staff, the chance that the outcome of a decision was accepted by others, and the amount of disagreement that arose across professional groups. The quote below demonstrates the level of disagreement found in hospital sites. The procurement manager at site B discussed problems of power between professional groups impacting on her ability, as a non-clinical administrator, to enact change in orthopaedic theatres:

*"I think the other thing is that it's not that... the surgeon-facing bit is not easy and it's also you have to be really, really clear, and I don't think we were perhaps as clear as we could have been when we first started because there's a... a Theatre Manager, you know, how much... I used to manage T&O (trauma and orthopaedics) so I do know it quite well obviously whether... but this should be coming from the T&O Manager and Specialty Director or it should come from theatres really not us." (INT M 37005)*

There was variation across the three hospitals, in terms of their ability to establish and/or change mechanisms to achieve organisational goals. The more efficient hospital departments appeared able to establish new ways of working. However, the less efficient hospitals often struggled to make changes and find new structures and processes. This was demonstrated by a surgeon who

described the compounding issues he faced in his daily work, just to allow him to conduct the necessary operations (INT C 218008). It did not include reference to any additional knowledge work or guideline implementation activities that could be undertaken.

Intriguingly, staff working in the more efficient hospital did not necessarily see or appreciate the changes that they had made. The consultant quoted below is from site A, and describes his frustration at the time it takes to achieve change within his hospital:

*"Frustrations, yes, at times to change things. We always blame the middle man I think because you speak to the board and you go, "That's a really great idea, go and make that happen,"... [but] it only takes one person to delay something and it takes ages to get beyond that. So the NHS is full of that. It's just nothing... we can't change anything quickly it's too big a machine." (INT C 198005)*

It was interesting to compare this belief to the sites where no progress had been made because of internal politics, or where change had led to unintended consequences such as staff conflict and fallout (B1 and B2).

#### **6.4.2 Approach to change knowledge mobilisation processes**

The patterns in the data help to describe, and therefore may help to predict, the knowledge mobilisation processes the organisations would undergo when they need to adapt and change in the future, for example, if new guidelines were to come into place or if hospital budgets were restricted further. I anticipate that in site B, the manager might not ever be in a position to receive guideline updates from senior management as it appeared that this was not a privileged type of knowledge in this Trust. Without a change to the internal processes, the manager would be responsible for searching for and prioritising relevant guideline updates for his department. During my observations, I noted that this lack of emphasis on organisational knowledge grounded in clinical guidelines was evident across the Trust, from members of the board to the surgeons working on the wards. Instead, achieving organisational targets appeared to take precedence.

On the whole, the behaviour of the organisation at site B appeared to be the command and control approach. This differed from site A, who tended towards a more encouraging and inclusive approach to change. Findings revealed differences in level of flexibility in the organisational norms and the choice of organisational behaviours. These appeared to be associated with how the management teams believed these norms and behaviours would allow for the effective control of the organisation. As an example taken from my observations, surgeons in site A were actively encouraged to innovate in practice and improve their treatments within the context of research programmes. I saw discussions about clinical problems, and surgeons here would comment “*what does the evidence say*” “*can it be trialed?... lets think about this*” (*OBS notes site A TPM*). It appeared that they were able to seamlessly merge their academic and clinical knowledge bases in their decision-making.

The surgeon groups working in site B seemed to be expected to conform to departmental standards, and discouraged or even reprimanded for operating outside established protocols. However, this control appeared not always to be achieved in practice; I observed many instances when individuals would just ‘say’ they are doing a task, e.g., following the protocol, rather than actually doing it. The administrative staff appeared to spend time back-tracking and completing paperwork and computer records that should have been completed (according to the protocol) by the clinical team during operations (*OBS notes site B code*). A similar situation was highlighted in an interview with a theatre manager who tried to maintain control over what implants were used in her site but found she had to “*fight every second of the way*” with the surgeons to achieve the task (*INT C 11901*).

However, data from my study has revealed that solving organisational problems involves more than streamlining services or working around the systems that are entrenched within the hospital. At site B, the hospital board aimed to overcome their knowledge mobilisation problems by implementing a new computer software programme. During the meeting, I did not observe any explicit evidence to suggest that this would be an effective solution to their

problems. I later discussed these plans with a member of the hospital board and he commented:

*"So I think if you look to see how many services in this organisation have been changed as a result of anything that NICE have done it will be relatively few, particularly outside the context of peer review. Having said all that, we are introducing a new IT system here which will have clinical decision support within it, and within the clinical decision support process best evidence will be introduced to support that. And that will include NICE, it will include other information sources like (software name) and things and that will help, and inform pathways, etc, that we've got running."*  
(INT M 37003)

It appeared to me that his concern was making sure the IT system functioned, rather than assessing the difference it made to the use of guidance in practice and the achievement of quality standards.

Throughout the findings, it became apparent that improving organisational capacity is difficult. It may require the organisation to evolve and develop as a homogenous group, however, for the reasons described in previous results chapters this may be an insurmountable task within the healthcare environment. Such an adaptive approach to change might require understanding and working with organisational knowledge, rather than just adding additional layers of process, such as computer systems and internal targets. During my observations, I saw little evidence of clinicians, managers and administrators working together towards an organisational goal. For example, individuals would attend meetings with what appeared to be a vested interest in what they needed from the decision-making activity. These were innate issues reflecting the organisational cultures of the NHS Trusts I studied, and were commonplace across all three sites.

#### **6.4.3 The organisational culture of the hospitals**

Interviewees in site A appeared to believe that culture was something that the hospital 'had', and therefore that it was possible to change and manage it to align to the organisational strategy. The quote below illustrates that at site A, management and clinicians actively sought to employ academic consultants to uphold and maintain their research culture:

*"So we've yes, approached excellent people from all over the country who want to come and work in our environment. So the Trust exec see that as really important." (INT C 218008)*

Site C differed, as their culture appeared to be something that the organisation 'is'. Staff working here were accepting of the culture in which they worked. I did not observe any particular action to try to resolve it. Staff I interviewed seemed to be resigned to the belief that change was impossible, through the use of phrases such as *"but there is nothing 'I' can do about it"*, or more worryingly *"I will just leave and go to (name of different hospital)" (OBS notes site B gen)*. More so than in either of the other two sites was 'that's the way we do things here' given as a reason for decisions that had been made, or actions that had been taken.

In site B, it was necessary to uncover the implicit processes and constructed meanings staff gave for their behaviour and how these changed, helped or hindered organisational control. The key driver here appeared to be the clinical community and the power and discretion this community held over knowledge, decision-making and practice. One recurrent issue that influenced the organisational culture was who the staff believed they worked for. The observation note below reveals how this could be Site B as the organisation, but more likely staff would refer to themselves by the split site name of B1 or B2:

*"Site B has two conflicting cultures. Site B1 is the large modern hospital (the big brother in a deprived area) whereas site B2 is the smaller district general hospital (the little sister in an affluent area). The staff, particularly those that had worked for the organisation for a long time, seemed reluctant to want to accept that they worked under the larger Trusts name. This was because Site B1 was the county named hospital, and hence the name that was taken for the Trust when they merged. Accepting the new name meant that site B2 somehow lost their identity, which they counteracted by continuing to say they worked for the old site name. Staff always referred to themselves as B1 or B2 and even corrected me if I called them the joint Trust name." (OBS notes Site B1 B2 summary)*

These underlying assumptions represented the unconscious principles that structured the thinking and behavior of the staff working within the

organisation. This played out in their ability to share knowledge and work together:

*"Staff from site B1 and B2 seem to not want to physically work or share documents in meetings that came from the other site...the places are very different in terms of the B1/B2 divide...B2 is seen as this lovely (place) where pavements are paved with gold and B1 the poor relation." (OBS notes Site B1 B2 summary)*

These assumptions and principles develop into the organisational knowledge of the Trust, and appeared to work at both conscious and unconscious level to drive behaviour and the decisions that were made in the Trust. The culture at site B might be linked to the structural contingences of practice and the legacy knowledge of what had gone before when it was two separate organisations. This contrasts with the explicit protocols and established hospital processes in site A, or the strong shared professional norms that appeared to be established in site C.

#### **6.4.4 Clinical autonomy and organisational sub-cultures**

The entrenched beliefs and values of organisational culture that were described in the literature review chapters (Chapter 2) may be more difficult to change. My data revealed that the organisational culture may be one of the factors which enabled the orthopaedic departments to resist external influence by policy-making organisations such as NICE. My findings uncovered the limited capability to change the power and culture of clinical autonomy held by surgeons across the three hospitals. The clinical professional groups appeared to maintain their elevated position, despite the organisational changes and cost saving programmes that were under way at each site.

However, the observed organisational cultures were not consistent across or within the sites. Instead, distinct sub-cultures developed (See Chapter 5) and were often linked to the professional groups within the hospitals. The clinicians consciously and unconsciously appeared to differentiate themselves from each other through their behaviour, attitudes and language. This differentiation is highlighted in the observation note below, which describes surgeons in a meeting using technical language which was not understood by everyone

attending the meeting:

*"During the (rationalisation) meeting the surgeons used the specific product names rather than the brand names or generic terms for the implant devices, for example they referred to the "CMK" or the "SP3". I struggled to keep up with the conversation despite being fairly knowledgeable about the device names because of the recent review I was involved in. It was clear that the managerial staff did not know either as the conversation seemed very one way. They were being talked at, rather than talked to. This acted as a knowledge divide which helped to separate and elevate the surgeons' talk from the managers." (OBS notes ration meeting Site B1)*

I asked one of the managers afterwards how she felt the meeting went, as expected she found it *"difficult"* and needed to ask for clarification regarding the implant selections. Her response is detailed below:

*"I couldn't believe [it]... And after the meeting... It was a very difficult meeting and I am feeling quite deflated. And then thinking about it afterwards thinking. What they've said has forced them down this route really... you've got to be so careful and you've got to ask the stupid things like, "Does this piece go with this piece and this piece..." (INT M 37005)*

Opposition between the sub-cultures was evident, particularly between the clinical and non-clinical staff. This appeared to be a norm of NHS culture as it was observed at all of the three sites I studied to varying degrees. Of course, ideally managers would be proficient in resolving conflict. For instance, they would be able to create the structures and processes that could guide and control activities within hospitals, i.e., the day-to-day processes, without simultaneously allowing the norms and behaviors of sub-cultures to become so ingrained and fixed that future innovation and change was restricted.

#### **6.4.5 Non-compliance with processes**

The key finding here is that, as might be expected, change required not only a change in organisational structures and procedures, but also a change in the attitudes and values of the workforce. All three sites had structures and processes in place to implement change and to try to control hospital activities, for example each site had governance processes to implement clinical guidelines. Nevertheless, the organisational norms and level of compliance with these processes varied, particularly amongst senior clinical staff. I found this to be the



case when the hospitals were implementing new or updated NICE guidance. The administrators who were responsible for these processes at all three of the sites reported problems with clinical engagement and compliance with the processes. The quote below reveals the multiple issues at play and the variation that was commonplace. When asked if the identified clinical leads responded to the requests about NICE guidance implementation, the administrator at Site A said:

*"Some we do, but then some we don't get any back, and then we have a procedure then to follow up non-compliance, or non-response to our emails. But it's then that, if they say, "Yes, we've met it", it's the evidence to show that they are actually meeting it. Yes, a lot of it, you know, it is down to, you know, just taking the word that, you know, that a consultant's going to come back and say, "Yes, we're compliant to this", [it's] not good enough." (INT A 218015)*

It was interesting that an email from the consultant was *"not good enough"* to demonstrate that compliance to the process had been achieved in site A. This was not the case in site C, as described by the administrator responsible for NICE guidelines in that Trust:

*"We do have a process. We ask them to complete that form initially to say...I mean, we hope that they'll say at least that, that they intend to become fully compliant. I think not all the quality standards get implemented within two years but they seem to be working towards it so that's acceptable. But however, if they tick six or seven, an exception report is required, which is that one there, so basically they've just got to say...Why, yes, in a word... The people who are best at filling out these are nurses, midwives, rather than consultants. I think they take more time. The medical staff are not good at doing it. They just don't have the protected time. And again that's understandable." (INT A 198002)*

This finding is supported by my reflections which describes *"tick box compliance"* to NICE guidance that seemed to be the norm at site C:

*"Despite this reported process, I asked to look at the report for the particular hip replacement guidance I was interested in (TA304). The administrator looked it up on the database as it was highlighted green and she told me it was compliant. Out of interest I asked to see what evidence the department had provided to show their compliance. It turned out that the lead surgeon in this hospital has written "we are compliant ☺ (signed first name)". I asked if this was sufficient evidence and the administrator said yes, they have to take the clinician's word for it. I thought this was a*

*classic case of tick box compliance and was not really evidence of anything other than getting a response to a question.” (OBS notes Site C notes from INT A 198002)*

Lastly, the situation at site B appeared to mirror that found in site C. This administrator asks the consultants *“is it relevant?” “do you think we are compliant?”* and accepts a ‘yes’ or ‘no’ response as sufficient:

*“So you know at the very least they’re going to... you know. They’re going to read that. So anyway, and then we ask them... So they normally give... The director will give it to the person that is most specialist, I guess, you know, in their area, and then it’ll say, ‘Is it relevant? Do you think that we are compliant? If not, why do you not think that we’re compliant? Please state. Can you evidence that we are compliant? Can you tell us of some pieces of work to evidence that we are compliant with this? Do you see there being any training needs?’ It’s that kind of stuff. But it’s a ‘Yes/No’ with a comment rather than asking them to produce a statement, you know, and that’s one of the things that we found didn’t work, you’d just sit there waiting for things to come back and it just doesn’t happen.” (INT A 119009)*

Elsewhere this administrator used the words *“professional responsibility”* and *“duty”*. This expectation of action and obligation of the clinicians with regards to NICE guidance was not evident in the interviews with clinical staff. Instead, one senior surgeon who sat on the surgical board in the Trust referred to NICE guidance as *“another layer of administration”* (INT C 37003).

Together, these findings demonstrate two distinct sets of beliefs, attitudes and considerations of knowledge between the organisational sub-cultures in this site. They were working at polar opposite points of view, both appearing to believe that NICE guidance was the responsibility of another sub-group.

The narratives above demonstrate the lack of an evidence-based feedback loop between administrators, managers and clinicians. This seemed to be accepted within the culture of the organisations. However, site A commented that they were making changes to their policy to try to establish more effective knowledge mobilisation processes. Organisational culture appears to be an important factor in understanding the ability of a hospital to achieve performance targets in line with the organisational strategy.

#### **6.4.6 The absence of lasting relationships**

The clinical and non-clinical staff differed culturally and formed noticeable sub-groups, but needed to be receptive to working in the shared organisational culture. Developing a functional organisational culture is an important but seemingly difficult task, as it is the end product of the actions and experiences of many social groups and their interactions. It would be expected that an organisation is more likely to develop a strong culture if they have a stable and homogeneous membership and stay together for a long period of time. However, this was not the case in the hospitals I visited. Staff turnover appeared to be high, particularly within management and administrative roles. This was revealed via discussions with both clinical and non-clinical staff. The clinical staff refer to the situation as “*going in circles*”, whereas the manager states that surgeons can see non-clinical staff as “*transient*” which impacts on their engagement:

*“There had been quite a lot of HR issues with them, the way they (the surgeons) behaved, I think they hadn’t had a set manager which doesn’t help, they’d several, so they get used to somebody and then they’d go... when I first came here (CD name) said to me you’ll be here 18 months and you’ll be off, you know, they generally think that you’re going to be here twelve or 18 months and you’d go so they don’t... So I think sometimes that’s why you don’t necessarily get the engagement with you because they just see you as transient.” (INT M 218014)*

This level of management and administrative turnover hindered the opportunity to build a strong organisational culture across all members in the hospitals. Staff appeared to have limited time and sometimes limited interest in developing patterns of behaviour and shared values, beliefs and assumptions across groups in their organisation, instead choosing to “*stick with their own kind*” because they did not want to invest time and knowledge in a person who they believed was going to leave in the near future (*OBS notes site A general*). The clinical staff, on the other hand, would remain in post for long periods of time. It was easier for them to build relationships, particularly once they had achieved the consultant role.

#### 6.4.7 Conflict between the sub-cultures

My literature reviews demonstrate that a strong culture encourages staff to feel that they belong to a hospital, because they have shared identity, values and goals, and limited conflicts of interest. Instances observed during data collection demonstrated weak overall organisational culture as staff orientated themselves and their work towards the goals of their department, their personal ideals or that of their professional group, before those of the hospital. The excerpt below demonstrates this inward facing orientation. A procurement manager describes surgeons *“hiding behind”* the notion that the patient is the focus of their work, rather than tackling the efficiency and purchasing decisions. The quote reveals the problems he faced when trying to merge the clinical and managerial knowledge and sub-cultures in order to reduce the amount spent on hip replacement implants:

*“If we’re going to get more work from the CCGs, if we’re actually going to create efficiency, we have to have some overall purchasing strategy. But at the local level, trying to get a surgeon that has a very good rating on a particular hip to change. That becomes – impossible.” (INT M 119002)*

Across all three sites, formal controls and governance protocols were established to try to maintain and internalise the behaviour that was desired by the management of the organisation, for example, having an established ‘Procedure for Implementing NICE Guidance’ in place at site C that had to be reported against at board meetings (*Doc analy site C NICE*). Often this command and control approach only resulted in ‘work arounds’ by clinical staff and conflict between sub-groups and the organisation. This conflict was illustrated by a lead nurse in theatre who described the need to *“manage and manipulate”* the surgeons to behave in a certain way:

*“They are, surgeons anyway are a difficult group to manipulate but orthopaedic surgeons are a very difficult group to manage and manipulate so you’ve got to learn how to, to sort of make them recognise it. It’s got to be something unique for them.” (INT M 119014)*

The sense of conflict between sub-cultures appeared to result in the formation of attitudes, beliefs and actions that were at odds with the organisational culture

and strategy of the hospital. This was the case at site B and C where what had formed at these sites were independent orthopaedic departments which appeared to function as standalone units.

This appeared not to be the case at site A; however, there were also differences in organisational sub-cultures in this hospital. There were distinct attitudes and behaviours of two new consultants in site A when they had to take on new organisational responsibilities. This illustrates how staff entering the organisation from elsewhere needed to learn the organisational hospital dynamics, and where they might want to sit within the organisational structure.

Managers working across the three sites appeared to find it difficult to meaningfully integrate themselves into the orthopaedic departments. The quote below shows how this resulted in problems encouraging the management staff to take an active role in the organisational planning and management of the “one service” at site B:

*“And there is very much this thing... and this definitely is in orthopaedics and I don’t know whether it is applicable to other parts of the organisation... but we keep talking about, you know, “We are one Trust and we are one service.” And even members of my own management team, [we’ve] got one based here (site B2) and one based at (site B1), and the one at (site B1) does come over here because everything happens here, meetings and that, but the one who’s based here (site B1) goes to (site B2) only if I send her for a meeting, and still she’s, “Well they work very differently at (site B2),”.” (INT M 37004)*

#### **6.4.8 Sub-culture reference groups**

As described in Chapter 5, the attitudes of the professional groups were formed and reinforced by their positive identification with their reference group. In all three hospitals I studied, the orthopaedic surgeon reference group appeared to be other orthopaedic surgeons in their department, not the organisational culture of the hospital. The function of the reference group was to assist the members in forming identities, attitudes and knowledge similar to other members of their CoP. Therefore, the findings suggest that when organisational decisions have to be made, the surgeons tended to align the options which most suited the standards of their group. You can see this reflected in the observation

field note below. During the rationalisation meetings the surgeons provided “excuses” not to change their practice and methods of working, which halted organisational progress:

*“The surgeons attended the meeting and seemed to be reluctant to even consider what was being presented by the management before they started. Not all surgeons who were expected actually attended. They did not want change in any form and were providing excuses as to why the planned rationalisation would not work before the evidence had even been presented. They seemed unwilling to work together (surgeons from B1 and B2) or work with the procurement managers. The manager who was leading the meeting only got approximately two thirds through her presentation before she ended the meeting as she knew she was not making any progress. Everyone seemed to be getting more agitated. The surgeons were talking amongst their own groups and disagreeing and disrupting the conversation.” (OBS notes ration meeting Site B)*

What became clear in the findings was that changing or establishing organisational culture might not be achievable through top-down command and control, as demonstrated in site B above, or by a reliance on staff advocacy of the organisational strategy. Approaches to change organisational culture to improve knowledge mobilisation and evidence use appeared to need to focus in on the sub-cultures that existed within the hospitals, and the individual attitudes and beliefs of the staff and their reference groups.

They also needed to be part of a wider transformation to challenge counterproductive organisational knowledge and assumptions that could be made, for example the suspicion, agendas and ulterior motives that were associated with the implementation of NICE guidance. Attempts to make superficial changes to high-level issues in isolation, such as implementing an updated clinical guideline, appeared to have limited impact in all sites as they did not take account of the sub culture(s) of the organisation, or of its structure, available resources, clinical autonomy, management control and staffing – all issues which appeared to dictate the ability of the hospital to function.

## **6.5 Types of knowledge that influenced decision-making in the organisation**

I identified two distinct types of knowledge which acted at the level of the organisation. They represented an important component of decision-making for orthopaedics across the three hospitals. They are referred to as managerial knowledge and organisational knowledge. These knowledge types appeared to influence how decisions were made and therefore the actions and behaviours of staff working within the three hospitals. Each knowledge type will be discussed below with examples taken from the data.

### **6.5.1 The influence of managerial knowledge in this study**

Managerial knowledge characterised the routines and capabilities of practice for the individual orthopaedic departments. The findings revealed a distinction between managerial knowledge that came from inside or outside the orthopaedic departments in the organisations. These were seen as two distinct sources of evidence, although it appeared that a clinical weighting added to the dominance of the orthopaedic managerial knowledge. For example, knowledge from the clinical director of orthopaedics contested the knowledge that came from the general hospital governance board.

However, this seemed to be dependent on the accepted definition of who ‘the management’ was in each organisation. In some instances this tended to be the same entity (site A), but it could be separated between management and clinical staff (site C) or held by an individual in an unofficial role (site B). This apparent flexibility in ‘management’ was observed across all three cases. The excerpt below demonstrates how staff working in site B had a designated organisational structure, but in practice the lines of reporting differed. The manager quoted below reveals the difference between the “theory” and actual “reality” of management at site B:

*“Okay, so in terms of organisation, the way it works here is they have in theory a service line clinical leadership model. So Trauma and Orthopaedics is led by a Specialty Director (SD) who’s Mr (name) but who... And technically I work for him, but really we work as part of a tri, so myself, the SD and the Matron all work together. And, yeah, the SD is ultimately the person responsible for the service*

*line which is just Trauma and Orthopaedics and Orthotics. However, in reality, I report to the (name), so they have at a divisional level a person who maintains overall responsibility for the whole division, I suppose, who's the person I report to. So that's how it works, I guess, in terms of structure." (INT M 37004)*

It appeared that the management at site B had little control over the clinical staff. Instead, they focused on the administrative functions and the business side of the organisation. The Speciality Director (SD) mentioned above was theoretically responsible for the clinical management at this hospital. However, the coffee lounge conversations I observed in this site revealed management provided by the SD only on paper. One surgeon suggested that the SD's management was in *"title only"*. This was supported by my observations, as I did not see him attend monthly departmental meetings (*OBS notes site B T&O*). This perceived lack of control might be one reason why the two distinct groups of surgeons at site B1 and B2 had been allowed to form and function independently.

Managerial knowledge is subjective and experiential, and was often not written down in a codified format for healthcare staff to access. The tacit nature of this managerial knowledge appeared to make it difficult to mobilise knowledge between and across the organisation, individual departments, or professional boundaries within the same organisation. This might have contributed to the differences I observed in the understanding, interpretation and use of the knowledge for the delivery of orthopaedic services. In the excerpts below, I give an example of how different types of knowledge interacted; the knowledge from managers in *"hospital guidelines"*, linked to *"cost savings"* appeared to have little relevance for the two relatively junior surgeons in their daily practice. Both, instead reference the *"consultant"* decision as being more important:

*"Like a, the hospital has got the same sort of hospital guidelines and they spot links to all the NICE guidelines and things so it's easily accessible. But it depends I guess what question you want an answer to and I guess in orthopaedics, apart from the sort of medical side of things, what drugs and things we use, in terms of orthopaedic decision making, it is based on certain principles and you generally sort of follow whatever your consultant practices." (INT C 218010)*



*"Yes, I mean I think cost savings is something which, in a sense it should come in to the hospital's decision making as to what they suggest people use and ultimately, you know, once you are a consultant, you should be involved in that process, certainly to decide what implants we are using or what other sort of equipment we are using and things like that, so that should be based on consultant's discussion with management etcetera but I think at my level (junior doctor), I don't think, you know, we just sort of use what we are given to be honest, yes." (INT C 198001)*

#### **6.5.1.1 Uncertainty in managerial knowledge**

Uncertainty existed in determining what the accepted levels of cost, safety or quality were for the department and the organisation in each hospital. These definitions varied not only across the three departments, but also within each hospital site. This appeared to result in a tendency for the person responsible for decision-making to revert to the norms of their professional group or colleagues, rather than the organisation's plans that management promoted as the ideal.

This uncertainty is shown in the quote below provided by the senior nurse on the orthopaedic ward at site C. He describes how his authority to make decisions was uncertain, and depended on the presence or absence of doctors on the ward. When doctors were present it was *"their job to manage"* and make decisions, and he did not *"try to get involved"* even though he could. However, when doctors were absent he had to *"manage the whole thing"*:

*"Medically, medically yes, yes it's straightforward. They are planned surgeries. So they have been, they know what's coming. If it's a medical problem I don't try to get involved. I can manage but I don't want to do that. The SHO's job to manage it, but overall they can't do it if nobody's there. But sometimes these complications that happen, and I have to manage the whole thing." (INT C 37016)*

Uncertainty appeared to be present in decisions made by managers as well as by the clinical staff. The logistics and procurement manager at site B explained how he had to balance finances and government targets within his Trust to enable him to provide a service, he described this process as *"very difficult"*:

*"It's very difficult, we went through a procurement stage four years ago where we had to save some money, we were, you know, like any Trust it's a business, you don't like to think it is but it is a business, you know, you've got your QIPP (The Quality, Innovation, Productivity and Prevention*

*programme) commitments that you have to reach every year, you've got targets that you have to do. Because you have to look at... you have to have a certain look at rationalisation"(INT M 37002)*

Important managerial knowledge was held by middle-level managers within the three hospitals. This appeared to be the knowledge used for the day-to-day functioning of orthopaedic departments, but was only accessed by clinicians when they felt it was necessary. My observations revealed that each hospital had a single person, generally called the Trauma and Orthopaedic Manager, who was responsible for managing the department. However, their ability to influence decision-making on the wards was questionable. In each case, the person was non-clinical and in two of the three sites (B and C) their desk space was not co-located with the surgeons. In site A, the manager's office was located in the orthopaedic ward. This appeared to help facilitate the relationship between the surgeons and the manager. I observed increased amounts of communication between the surgeons and the manager at this site (she had a visible presence on the ward and appeared to be able to approach the surgeons when required).

#### **6.5.2 Organisational knowledge as a distinct type of evidence**

As I described earlier in this chapter, organisational knowledge appeared to shape the way the organisation behaved as a whole rather than at a departmental level or funding stream. The knowledge and skills of the individuals who managed the entire hospital appeared to be considered valuable, but they seemed intangible across the three organisations. Senior management activities, such as governance and financial planning, happened in the background and did not appear to be visible to the front-line staff. The surgeons seemed to appreciate that without the senior managers and administrators, the hospitals could not function as an organisation, and would often make reference to the *"executive"* or *"board"* (OBS notes site A and C gen). To me, this group of managers were characterised by interviewees as a faceless entity, rather than a collection of named individuals.

Nevertheless, whenever decisions were made on what was best for the patient or patient group, organisational knowledge, perhaps rightly, appeared to be considered less important than clinical knowledge. This was particularly

apparent when I examined the cost of service provision. It was important for the surgeons to consider the cost of orthopaedic implants in general terms, as described below *“cost does come into play, in a smaller amount”*. However, in the reality of practice, cost was rarely considered in decision-making, particularly for implant selection.

*“Definitely. Yeah, no, it does. I mean I don’t think it should ever compromise quality, so to me number one, top of the list is new quality so if there’s something that a patient’s going to benefit from which is more expensive, but actually that’s a better prosthesis or a better operation, then yeah, I will not think of cost at that stage at all. So cost does come into play, in a smaller amount.”(INT C 218002)*

The key sentence in the quote below illustrates how clinical knowledge is privileged over organisational knowledge, when the respondent says *“Unfortunately there’s, in medicine there’s always a way of justifying whatever (implants) you want”*. I asked if he knew the cost of the implants he used:

*“Probably not enough detail but we know that most of the instruments and implants that you use in elective orthopaedics are expensive and we know that the newer ones tend to be more expensive. You’re given quite a lot of autonomy as a surgeon so you are allowed, often allowed to pick those devices, less so now than you used to be able to because increasingly other people make those decisions and it’s supposed to be based on evidence. It often usually is actually but still you are given some ability to, to pick what you want to use. As long as you can justify it. And there’s lots of ways to justify it. Unfortunately there’s, in medicine there’s always a way of justifying whatever you want in my experience. To the commissioners you can often, often justify it.” (INT C 218011)*

The senior managers and their knowledge domains appeared to be respected as part of the whole service delivery process, but were outside what the clinicians considered as the core business. Organisational knowledge seemed to have little impact on the ability of the surgeons to treat patients day-to-day. Instead, they clearly believed that they would do what they thought was necessary for the patient in front of them at the time of decision-making and *“spend the extra amount to get that particular kit that you require for that case” (INT C 218002)*.

This personalisation of services was apparent across all three sites I visited, even in site A where the implants had been standardised. The surgeons were able to request “*special case*” implants or kit ‘on loan’ which I later learned, was at a significant cost to the organisation (*OBS notes site A gen*). This demonstrates that organisational knowledge was not able to compete with clinical knowledge which the surgeons used when making decisions for patients.

On occasion, I came across surgeons who believed that it was their responsibility to get involved in organisational decisions. The surgeon quoted below was from site A; his motivation for actively taking part in this level of decision-making was because he believed the managers did not have the appropriate knowledge to do so. When referring to the senior managers’ decision-making processes he suggested that “*those people won’t know what the clinical problems are so they might make the wrong decisions*”...which is “*dangerous for patients*”. Again, this helps to represent the divide between groups and their knowledge types:

*“So yes, I do get involved which is not always a particularly pleasant thing to be involved in it’s just a lot of nagging and hassling and negotiation, but I think if the clinicians ... I firmly believe that we should be involved because if the clinicians don’t take responsibility for what they spend then someone else has to and those people won’t know what the clinical problems are so they might make the wrong decisions.” (INT C 218008)*

#### **6.5.2.1 Organisational authority over knowledge**

It might be expected that the privileging of organisational knowledge in the field of orthopaedics would be increasing, due to the rising demand for treatments from patients, coupled with the pressures to reduce resource use from Government. However, this appeared to not be the case in my empirical work. Instead, the findings suggest that the influence of this type of knowledge in clinical practice fluctuated. This depended on the level of authority that management held over other staff in the three organisations. At site C, managerial and organisational knowledge held very little power over the decision-making of the surgeons, largely because they appeared not to share information and knowledge across professional groups.

Site B appeared to have the greatest boundary between managers and clinical staff. However, the tensions might have been reinforced at the time of study, because they were yet to complete their rationalisation process. One consultant surgeon believed that organisational knowledge was forced upon the surgeons from above, and that the biggest influencer on decision-making for his organisation was “*price*”(INT C 37011).

Across all three sites, I noticed a distinction between the organisational knowledge that came from within the department, i.e., from the ward managers, and knowledge that came from the wider NHS organisation. The organisational knowledge had a wider structural emphasis and it appeared to be ingrained in the routines of the hospitals. However, the individuals themselves did not necessarily acknowledge that this type of knowledge was an influence on their behaviour and decision-making.

The knowledge appeared to exist in the day-to-day processes themselves, and in the individual actors who were tasked with making the decisions. However, this appeared to be flexible, for example, during a theatre planning meeting at site A;

*“Theatre planning meetings ensure the “effective planning and management of operating sessions to improve services to patients and ensure optimum use of operating theatre capacity” (Doc site A Theatre Operating List Session Scheduling Policy). A theatre manager told me that planning helped “reduce waiting times for patients and avoid cancellations”. But it was not simple. Theatres were expected to run between 9.30am and 5.30pm but the reality of this changed, and time changes materialised each day. The situation became even more complex when any emergencies came in. She said, “trying to get us more time and space, is kind of a balancing act”. (OBS notes site A theatre)*

I observed decision-making according to patient prioritisation brokered against resource availability in the Trust. The excerpt below represents a decision which called for organisational knowledge, of the “*time and space*” available in theatre, and clinical knowledge of which patients have or should have “*priority*”. However, even the consultant in charge stated that this decision was “*bigger than me...I can’t answer this, this is bigger than me*”:

*"Theatre managers would read through planned operations and suggest a theatre, time and surgeon in a directive manner; "Mr (name) can have him" or "we cant do him today we don't have space". I asked if consultants ever disagreed with his planning. He said "Sometimes, they trust us, they know that the reason they've got us is that we have ideas as to who's waiting and who takes clinical priority, but ultimately if I can't make a decision because I've got eight (priority) patients we leave it to the consultant, some are more proactive than others." I ask what happens, he recalls "Some of them (say), "This is bigger than me, I can't answer this, this is bigger than me" and I sort of said, "Well if it's bigger than you it's a whole lot bigger than me." (OBS notes site A theatre)*

It was interesting to observe how the role of decision-maker was passed back and forth between the manager and the consultants during this meeting. The lines of responsibility were not explicit, and the boundaries blurred depending on the patient prioritisation and available resources each day. The way that these decisions happened in context and their outcome appeared to depend on a combination of tacit managerial and organisational knowledge to make decisions at a certain point in time. This might be a source of variation in the practice of orthopaedic surgery both within and across the hospitals that I studied.

However, the variation that was present should not be deemed poor practice, as often there were a valid contextual reason for the decisions. As shown in the field note above, not all of the eight patients that needed to be treated that day could be treated, due to lack of resource in the hospital. Instead, variation appeared to result from the managerial and organisational knowledge types at work, these included the scheduling and categorisation of patients as 'for', or 'not for' surgery (access to treatment), levels of treatment delay (waiting times) and the selection of orthopaedic implants for patients (quality of treatment provided).

Because of the greater weight given to knowledge emanating from other orthopaedic surgeons, decisions tended to be made using clinical knowledge on behalf of the orthopaedic surgeons as a powerful socialised group, not by managers using managerial and organisational knowledge for the benefit of the hospital as an entire organisation.

There were many instances during my period of observation where non-clinical managers working in the hospitals appeared to struggle to counteract or challenge the prestige and autonomy that clinical staff held. This was an area of conflict for mid-level and senior managers who were unable to proceed towards their goals, if these contested the surgical plan or ideals. An assumed level of acceptance developed a 'glass ceiling' effect where organisational decisions only appeared to proceed so far, before the professional clinical gatekeepers halted plans or limited what could be achieved in practice.

## **6.6 The role of clinical managers for improved knowledge sharing**

One tactic used by the hospitals in an attempt to address this conflict and overcome the lack of knowledge mobilisation was employing clinicians into senior managerial, or hybrid clinical-manager roles. The rationale for these boundary spanning roles was introduced in Chapter 2 with the discussion of boundary spanners. At each hospital site, there was a clinical director in charge of the surgical department, who also maintained his or her clinical role in the orthopaedic department. It was extremely important to these individuals that they were able to maintain their clinical position in the organisation, and were not seen to be moving to the "*dark side*" of management (*OBS notes site A gen*).

A senior clinician at site B is quoted below, describing how he was able to make changes in his Trust by introducing a "*peer review process*" i.e., clinician-to-clinician assessment, rather than the traditional approach of management auditing the performance of clinicians against a guideline. He describes this novel approach as "*productive*":

*"Well, I mean, the only thing I've done with NICE was I was the clinical lead for one of the guidance documents and that... I mean, that was productive because it was then the whole national process for management. A programme of peer review was then constructed around the document, and so if you weren't fulfilling the... So in our organisation, well across the Trust, we would have a peer review process, they would look to see whether you complied with the standards, if you didn't then actions at various levels went straight back to the Chief Executive and things were done."* (INT C 37003)

A surgeon at site A suggested that the key variable in achieving effective hybrid roles, and hence good knowledge sharing between the orthopaedic team and the executive, was the personality of the clinical managers. He is described below as “*just very opinionated*” but this individual appeared to be able to change the views of the managers and improve the cross-functional discussions:

*“So if you’ve got ... we had a very, very effective clinical director here who’s just very opinionated and driven and had very firm ideas about what was good but also very personable. So the exec liked him. Which was hugely powerful and so we went from a department that seemed to be kind of important because we were big and there was a lot of money going through the department but not particularly on the management side, bit too much autonomy historically, bit too vociferous, occasionally troublemaking group to being seen as being part of the exec’s team...yes there’s tensions, there’s always going to be between the senior management and the clinicians, but much better than we had previously.” (INT C 218008)*

Despite these positive narratives, I often observed a lack of presence of the senior clinical managers at management meetings. Attendance could not always be guaranteed, and this appeared to be accepted in the meetings because the clinical work “*had to come first*” and the managers felt this “*was understandable*” (*OBS notes site A gen*). There seemed to be no apparent response or reprimand for the lack of attendance (*OBS notes site A CG meeting; OBS notes site B meeting*).

Individuals in these clinician-managerial roles appeared to develop personal tensions when trying to make decisions that conflicted with their personal goals of practice, against those that were for the best interest of the hospital. One surgeon at site A had to try to improve knowledge sharing by acting as the go-between. He described the role as expanding into the management realm to include “*everything from human resource issues in the department to discipline issues and professional conduct issues through to the finances*” (*INT C 218008*).

Surgeons at site C appeared to believe that these boundary spanning roles could help ease the divide between the different professional groups. The surgeon below describes how they helped to share the importance of managerial and



organisational knowledge regarding “budgets”, “profit” and “investment” with the clinical teams:

*“So actually that one-to-one relationship (with the manager) and how we talk to each other is how it works really and we are now I think trusted to do the right thing and that we are interested in keeping budget under control and only expanding where it’s profitable to do so for the Trust.” (INT C 198005)*

However, his colleague gave a slightly different view. Instead, this surgeon stated that the “*perception that you’re trying*” to understand managerial knowledge was more influential in getting acceptance from the management team:

*“So if you’re seen to ... make the effort to understand what the managers’ position is and why they’re trying to drive particular changes and particular ways, they’ll much more respect you.” (INT C 198003)*

One particular issue that I observed across all three sites was the surgeon manager appearing to advocate for their own preferred hip implant choices, during the implant rationalisation or prioritisation meetings. Their privileged position in both management and clinical camps gave an assumed weight and power to their point of view. However, at site B this resulted in tensions with other surgeons who saw the potential vested interest. This is described below when a colleague of the clinical manager said “*he’s going to get what he wants...How can he have what he wants?*” in reference to implant selection decisions (INT M 37005).

Brokering the equally important and valid sources of evidence and knowledge during decision-making was a difficult task for clinical managers. Knowledge that was not considered important (external and non-clinical), often appeared to be poorly absorbed or ignored by the medical professional groups. The individual clinical managers also did not want to take sole responsibility for managerial decisions. This appeared to be because of their clinical roles, and the impact that outcomes might have on their relationship with clinical colleagues.

For example, the surgeons at site C did not want to lose the respect of their colleagues by stepping outside their profession and appearing to prioritise the managerial or organisational knowledge over their clinical knowledge. Individual representatives working here, in particular wanted to “*check back*” with their colleagues before making an important decision at a planning meeting (*OBS notes site C gen*), for fear of being blamed if or when something went wrong or was not appropriate. In both cases, the decision-makers seemed to prefer making decisions through consensus by committee in practice.

## **6.7 Professional hierarchies in the Trusts**

There was significant importance attached to clinical knowledge across all three Trusts, and this appeared to be linked to the medical hierarchy. This hierarchy appeared to limit the impact that external knowledge could potentially have in practice, and the mobilisation that could take place in the organisation because of the power that surgeons held over managers who were responsible for overseeing the workings of the hospital.

Organisational culture appeared to reinforce this situation. It appeared to help establish a sense of organisational membership for the surgeons, which was grounded in ‘where you work’ as well as ‘what you do’. Within two (A and C) of the three hospitals there was a sense of organisational membership, as staff referred to themselves as belonging to their Trust as well as being members of their profession. At the start of the majority of my interviews, surgeons would say, “I am an orthopaedic surgeon at site X”.

Despite a general sense of organisational membership, the professionals in site A and the split B sites held a superior layer of identity that appeared to be defined by their role, i.e., what they do. Being a surgeon, and being an orthopaedic surgeon, outplayed or trumped being a member of the Trust. The professionals looked to be able to establish legitimacy, higher status, discretion and knowledge boundaries around ‘first’ being an orthopaedic surgeon. This might limit

absorption of knowledge from external sources, but also transfer of knowledge across the departments and in the organisation more generally.

#### **6.7.1 NICE and the professional hierarchy**

The lowest professional group had very little power and control over the other two groups, and were viewed as “*just the administrators*” in the organisation (*OBS notes site B gen*). Unfortunately, it was this lowest group who was responsible for the implementation of NICE guidance across all three case study sites. I did not encounter a single senior manager or clinician whose sole responsibility was guideline work, although, it was often a small segment of a wider portfolio of tasks for which they were responsible.

The response by internal hierarchies appeared to be consistent, irrespective of the type of evidence being produced and disseminated by the administrators. Internal hospital protocols were treated in the same way as the clinical guidelines directly obtained from external bodies such as NICE. This demonstrates low levels of absorptive capacity across the three organisations, as they were not in a position to actively identify, integrate, transform and use knowledge from external bodies in practice. The summary excerpt below details my reflections from attending NICE implementation meetings across the three hospitals. The words “*being ignored*” and “*overlooked*” by clinical staff were ever present in my findings relating to this topic:

*“At each site there was an individual administrator or department that was responsible for implementing NICE guidance (site A had a mixed seniority group but a single staff grade 5 administrator, site B employed two staff grade 6 administrators, site C had one individual who was staff grade 5). At NICE guideline meetings, all three sites reported an on-going issue of requests for action being ignored or overlooked by clinicians in the hospital. I attended more than one of these meetings during the three-month period and some issues had been on the agenda for months, and were not resolved before I left. The suggested solution to this was to escalate the issues to a senior clinician within the department, with the hope that they could have an influence down the hierarchy. If this was unsuccessful the hospital executive responsible for governance would be notified to investigate whether a risk needed to be registered. Only one hospital (site A) had a formal escalation policy that I could access and read, the other two hospitals relied on good will of other clinicians or finding the “right person” to act as a lever for change.” (OBS notes summary NICE meeting gen)*

Although the observation note above applied to NICE guidelines, it demonstrates the way in which important decision-making processes within the organisation were driven by the acceptance of the hierarchy and the roles of clinicians. This did not represent the hierarchy of evidence in traditional EBM as clinical knowledge always held more weight. For instance the solution quoted above was to *“escalate the issues to a senior clinician”*. However, this did not ensure that it was actioned. The administrators and managers were unable to act and move forward until the response from the clinical group had been received. Often, I observed that the response would not be obtained despite multiple requests over time.

The evidence from NICE guidance frequently appeared not to align to the socialised knowledge standards within the hospitals. In this sense, the codified knowledge in guidelines does not reflect the common values, language, procedures and know-how in the clinical departments or issues important for their context and therefore were not seen as a priority. The excerpt below from site B demonstrates that NICE guidelines were valued by the hospital board as a method to reduce variation, due to the fact that they *“avoid(s) people getting confused”* and avoid *“nurses doing the wrong thing”*. They were not seen as a way to crystallise the evidence-base. This manager believed he would *“fail to convince the consultant body in this organisation that guidelines are a good thing”*:

*“So the problem is you can argue about the pathway until you’re blue in the face. We’re internally at a sort of fairly senior level very convinced that reducing variability is a good thing to do. A method of achieving reduced variability would be to put in standard pathways and, you know, Quality Standards and NICE guidance and things would be a very good way of informing those pathways... it’s just by doing that you want to reduce the variability, and the reduction in the variability avoids people getting confused and nurses doing the wrong thing because it’s a Tuesday as opposed to a Wednesday or whatever, that’s the value in it in its own right, but I certainly singularly fail to convince the consultant body in this organisation that guidelines are a good thing.” (INT M 300515)*

This board member distinguished between nurses and consultants in the likelihood that they would follow guidelines, reinforcing evidence I have

collected elsewhere about the professional hierarchy.

## 6.8 Cross-case analysis: Organisations

Each of the hospitals can be characterised as distinct, displaying individual organisational knowledge, management strategies, structures and processes regarding their use of knowledge and evidence. Table 13 summarises the findings presented in this chapter with an overview of a variety of organisational factors between hospitals.

**Table 13. Overview of the organisational level factors by hospital**

<b>Knowledge, Capacity And Contingency In Organisations</b>	<b>A</b>	<b>B</b>	<b>C</b>
Organisational strategy	<i>Innovation and quality improvement</i>	<i>Personalised care for patients</i>	<i>Sustainability</i>
External demands	<i>Compliance with bodies such as NICE and to government targets</i>	<i>Achieving government targets such as best practice tariffs</i>	<i>Achieving local targets, for example set by the CCG and government targets</i>
Environmental pressures	<i>Increased demand on the entire hospital organisation, i.e., at A&amp;E, that impacts upon orthopaedics</i>	<i>Increased demand for services</i>	<i>Increased demand for services not matched by the provision of resources (more surgery less theatre)</i>
Rationalisation process (cost contingency)	<i>Rationalisation completed – very tight control</i>	<i>Rationalisation under way – little control by departmental managers, required senior board support</i>	<i>Free-for-all, rationalisation not yet occurred but sense that it will happen soon</i>
Process of organisational change (NICE implementation)	<i>Processes in place with escalation plans to senior management to ensure compliance</i>	<i>Processes in place with optional tick box compliance</i>	<i>Processes in place with tick box compliance</i>
Organisational culture	<i>Something the organisation has. Encouraging and inclusive</i>	<i>Something the organisation is. Command and control by management</i>	<i>Something the organisation is. Led by the professionals, i.e., the norms of the orthopaedic group</i>
Clinical autonomy	<i>Medium</i>	<i>High</i>	<i>High</i>

Organisational sub-cultures	<i>Present, academic surgeons and surgeons, managers and administrators</i>	<i>Present, sub-groups by physical location. Sub-groups surgeons vs. managers and administrators within B1 and B2</i>	<i>Present, surgeons vs. managers and administrators</i>
Conflict within the sub-cultures	<i>Low</i>	<i>High across site and within sites</i>	<i>High between management and clinical staff</i>
Managerial knowledge	<i>Recognised as important by clinical staff but not always acted on</i>	<i>Focus on achieving targets linked to financial incentives and cost savings</i>	<i>Not important, local clinical knowledge privileged</i>
Organisational knowledge	<i>Recognised as important by clinical staff but not always acted on. Strong sense that biomedical and clinical research knowledge was standard practice</i>	<i>Split site organisational knowledge focused on hospital processes and efficiency</i>	<i>Government targets and benchmarking is privileged</i>
Socialisation of professional groups	<i>Strong clinical academic professional identity</i>	<i>Strong orthopaedic professional identity at both B1 and B2 sites</i>	<i>Strong orthopaedic professional identity</i>
Role of clinical manager	<i>Yes, focus on management knowledge</i>	<i>'On paper only'. Role was established but responsibilities not always achieved</i>	<i>Yes, focus on the surgeon as the go-between with the managers</i>
Professional hierarchy	<i>Flatter structure</i>	<i>Strong within the two sites</i>	<i>Strong within surgeons at the top. Managers and administrators at the bottom. Flat structure within the clinical group</i>

## 6.9 Summary of the theme

This theme has highlighted how organisational knowledge and the capacity and contingences of the hospital influenced the use of evidence for decision-making in orthopaedic practice. Although each hospital was an organisation in its own right, each demonstrated varying levels of fragmentation. The cross-case analysis revealed that this included fragmentation between locations at the same

hospital in site B, as well as fragmentation between professional groups. In site C, there was a distinct sense of 'us and them' between the management of the hospital and the clinical staff. Of all three hospitals, site A had the most established sense of organisational identity, but the orthopaedic surgeons remained a distinct professional group with their own ways of working and methods for privileging evidence.

The key message from the findings presented within this theme is that decision-making and variation in practice may be linked to, and possibly predicted by, the knowledge, organisational capacity and contingences of the hospital. This appeared to be related to the organisational and managerial knowledge that was present in the three sites, and how much impact this had, or did not have, on the distinct professional groups. Clinical knowledge was privileged over other knowledge types. However, organisational and managerial knowledge seemed to hold more weight in site A than either B or C. Across all three sites, I noticed a distinction between the organisational knowledge that came from within the department, and knowledge that came from the wider NHS organisation.

Organisational knowledge appeared to shape the perspectives of clinicians working in that hospital when compared to clinicians working in the other locations, for example the general attitude of the organisation towards NICE guidelines at site A was that they are integral to practice, compared to sites B and C where compliance to guidelines was considered optional. This represented the characteristics of staff present in each of the hospitals.

As described in Chapter 2, organisational knowledge echoes the normative processes of the hospitals and replicates the common education, training and career structures of the organisations. Organisational knowledge in my study also reflected the organisational contingencies which acted on the hospitals. There were many instances of resource constraints which directly influenced decisions made by staff. The most common issues I observed included time pressures, theatre availability across the Trust, the presence of protected elective beds, surgical waiting lists and the method for prioritising patients for

surgery. I found no clinical guidelines to help facilitate decision-making for any of these issues, as they appeared to be context-dependent and changed daily. Instead, this organisational knowledge and its solutions developed over time and became entrenched. The knowledge then existed in the day-to-day processes themselves and in the individual actors who were tasked with making the decisions.

It is important to understand the different patterns of socialisation to discover how individuals act in different ways as a hospital member or as an orthopaedic surgeon. This changing dynamic was very difficult to unpick in the findings. It would be helpful to be able to predict when professionals are inclined to identify with their organisation and its aims, as opposed to when they identify as an orthopaedic surgeon concerned with 'what is best for me and my practice'. However, the traditional drivers of organisational identification, such as gaining a sense of prestige, may not have been an adequate motivator for the orthopaedic surgeons in my study. They appeared to fulfil their needs for prestige elsewhere, for example, through their personal affiliation and membership of a professional society, or through the conduct of high-quality research.

In order to overcome this and promote knowledge sharing, the organisations might need to provide a larger value proposition to the surgeons to motivate them to think 'hospital first' rather than 'surgeon first'. However, this solution was not observed in the findings from any of the hospitals I studied. There was an intrinsic value for the surgeons in having networks of 'people like me' within their Trusts who had the capacity to connect with others in positions of power to mobilise the knowledge they decided was important.

Being a surgeon was held in high esteem by surgeons and other staff because of the associated norms and advantages that the role brings, alongside the ability to maintain a higher position within the hospital hierarchy. This inevitability might work against the capability of the hospital and its managerial and administrative staff to absorb and mobilise knowledge and to develop as an organisation. It also



appeared to undermine the established standardised processes, structures and mechanisms set up to try to achieve organisational strategy and collective goals.

In this chapter I have described the organisational issues that influenced decision-making for surgeons in my study. The final results chapter will depict the regulatory environment in which individual surgeons, groups and organisations functioned.

## **7 Results 4: The Influence of the Regulatory Environment**

### **7.1 Introduction**

This theme describes the regulatory forces acting on the three healthcare organisations during the period of data collection. These forces originate outside the hospital, and are referred to as environmental influencers in this theme. In the UK, there are many healthcare organisations which are largely governed by the same regulatory processes. Within my study, these regulatory forces appeared to be enacted at three different levels: individual, groups and organisations.

Despite similar environmental pressures, my findings revealed that the organisational response varied. These apparent differences were also associated with how each hospital dealt with regulation from policy-makers and from professional bodies, which drove aspects of decision-making for the hospitals as entire organisations. This extends my previous theme, where I described how the capacity and capability of an organisation to deliver healthcare services might be affected by the wider social environment and existing structures.

The wider social environment in my study appeared to be legitimised by the established regulatory structures that I observed. This process of legitimisation sustained the knowledge that was privileged and used in the three hospitals. Organisational traditions in healthcare are generated by the national regulatory environment, develop over time and are accepted and maintained within hospitals in general. This meant that managers, orthopaedic surgeons and their work could potentially be compared across the three sites. This allowed me to examine how the regulatory environmental forces influenced practice for the sector as a whole.

This theme presents the case that the wider environmental influencers in the NHS impact on the development of organisational arrangements, tasks, roles, knowledge mobilisation, and management of knowledge objects and evidence, in

line with regulation. This alignment appeared to take precedence over and above the pressure to achieve internally-defined organisational success and standards. In this theme, I will use examples from the data to highlight how regulation from political and professional authorities influenced the use and uptake of evidence in the three sites. I will demonstrate how these wider environmental factors affected the hospitals' capacity for knowledge and evidence mobilisation, and helped to determine the practice of orthopaedic surgery and clinical decision-making.

## **7.2 Environmental pressure acting on hospitals**

The findings presented in the previous three results chapters have shown how each hospital adopted particular structures and working routines because of three types of pressure. These pressures are linked to the statutory obligations of the organisation, pressure to learn from and imitate others with the same professional identity, and normative pressure which originates from the attitudes and approaches of similar groups of people working in the organisation. This theme focuses on pressure from the wider environment.

In my study, statutory obligations extended beyond the individual hospital and orthopaedic departments and could include regulation by the professional medical authorities and regulation of the hospitals as whole organisations that deliver healthcare. Environmental pressure also appeared to stem from less formally-regulated sources. Considerations regarding hospital *“benchmarking”* for clinical outcomes against other hospitals, and the ability to achieve *“performance targets above the standard”* set by regulators were also mentioned (*OBS notes site A gen*). An example of this was found at hospital A, which had an internal standard to attain a 100% data collection target for hip replacement surgery, whereas sites B and C achieved the conventional target of 85% that was established by the national regulator.

The healthcare sector is notorious for its constant organisational change. Changes which have significant impact on the statutory responsibilities and funding arrangements of hospitals are regularly introduced. During the time of

my study, changes were being made to the way tariff payments were received for hip replacement surgery (*Doc analy BPT*). Often these changes are linked to system-wide organisational issues such as financial accountability and effectiveness. Achieving these changes, such as those made to the tariff, was not the responsibility of a single person in the three hospitals. This shared target complicated the situation, as it required a collective understanding of what was required and collective action to implement a change. This was not always the case in the three hospitals as fragmentation appeared to be the norm.

The traditions and structures that developed in each hospital over time helped to maintain the organisational fragmentation and promote its survival. An example is the established status and autonomy that surgeons held over decision-making within their hospitals, which helped to ensure that administrators and managers “*knew their place*” in the decision hierarchy, particularly when implant rationalisation programmes were under way (*OBS notes site B gen*).

Traditions and structures such as this appeared to make organisational change difficult to accomplish. They formed a barrier to change, and may have a negative impact on the competitive position of the organisation. The three hospitals were required to abide by regulatory targets for the selection of hip replacement implants and therefore they were all able to achieve a certain standard level of practice. This is similar for organisational service delivery, for example to be a designated orthopaedic trauma centre such as site A and C, hospitals have to function 24 hours a day, for seven days a week and have consultant-led specialists teams with access to diagnostic and treatment facilities including neurosurgery and radiology (*Doc analy NHS choices*). Therefore, it would make sense to assume that all orthopaedic trauma centres in the country function in much the same way. However, my findings have revealed that this was not necessarily the case. The multiple contingencies and constraints of practice which are presented and discussed in the other three results chapters appeared to influence how the organisation operates as a whole in relation to their wider environmental and regulatory context.

The presence of environmental regulatory pressures, traditions and structures, appeared to work both for and against knowledge mobilisation in the individual hospitals I examined. This may result in the hospital as an organisation behaving differently. Regulation helps to ensure that standard levels of practice for safety, quality and efficiency are reached, but will limit the opportunity for innovation and change in service delivery outside what is considered the normal range.

### **7.2.1 The regulation of healthcare professionals in England**

All three hospital sites had to conform and achieve the minimum professional regulatory standards set out by the relevant bodies and policy-makers.

Flexibility appeared to be influenced by how each hospital met the requirements of regulators. In my study, the 'environment' encompassed the wider delivery of healthcare in England, which is governed by the UK Health and Social Care Regulators (GMC, 2016). At the time I conducted the empirical work, there were 12 regulators. Each one governed the individual clinicians, therapists and registered staff across the UK (*Doc analy GMC*). To practise as a clinician in the NHS, an individual has to be registered with their relevant regulator, otherwise they risk being prosecuted.

In orthopaedics, surgeons have to be registered with the General Medical Council (GMC) and with their Royal College. The GMC is responsible for ensuring that surgeons are included in an up-to-date registry of qualified doctors. As an organisation, they aim to promote high standards of medical education and training and deal with individuals whose fitness to practise is questioned (*Doc analy RCS 2016*). Royal Colleges, such as The Royal College of Surgeons of England (RCS), on the other hand, are professional membership organisations. They appeared to have a more concentrated responsibility to improve surgical standards. They develop policies and good practice guidance that were used by surgeons working in the three hospitals, for example the 'Consent: Supported Decision-Making' guidance (*Doc analy RCS S&R*). Throughout the data collection, it appeared that the surgeons took pride in their membership of their professional bodies such as the RCS, and surgical specialty groups such as the BOA. The BOA and the RCS were upheld as organisations that could and should be trusted to regulate, even to review hospital functions.

During my data collection, it appeared that the surgeons and other clinicians were reluctant to step outside their professional bodies' regulations and guidelines. I also did not observe the surgeons or associated staff going against the standards set by regulators such as the GMC. I assume that this might be because the individual risks associated with violation of the regulations are of such great significance to clinical careers. For example, where doctors are seen as posing a risk to patients they can be immediately suspended from practice, asked to retrain or in serious cases be 'struck off' the medical register. The pressure of regulation on the practice of surgery was a recurrent theme in the findings. Surgeons used phrases such as "*be shot down in flames*", "*be hauled up*" and "*I'm expendable*" to depict their perception of negative reporting from regulators (INT C 37010), (INT C 37011), (INT C 198005).

The apprehension surrounding professional regulation was evident in interviews with non-clinical staff working in the hospitals. When asked to make a decision about an operation, the manager of the department at site B said "*it's not my registration on the line, it's theirs*" and suggests that this might be a problem that needs to be "*overcome*" (INT M 37004).

This strict adherence to professional regulation was counter to the bending of the rules that I observed regarding regulation as applied to the entire organisation. Throughout the data collection there were many instances of non-compliance or avoidance of targets set by government, or guidelines established by independent bodies such as NICE, or regulation promoted by the Care Quality Commission (CQC) or the local CCG at the organisational level. A CCG lead believed it was easier to "*go round*" the surgeons, than "*try and go through them*" when setting up contract objectives for the delivery of hip replacement. It was assumed by this CCG group that the surgeons would find a way to deviate from the contractual obligations that were agreed (INT M 218001).

At first glance, it appeared that the rules and regulations established by these groups might not be as important to individuals. However, it seems likely that

they were easier to bend, break or deviate from, or because any penalty was not enacted at an individual level. In the findings, ownership of regulation from the CCG, NICE or the CQC was seen as spread across the entire organisation.

### **7.2.2 The regulation of healthcare services in England**

I observed two types of regulatory forces acting on the three hospitals during my observations. Health and safety aspects were managed by the CQC, whereas the market regulators were the Department of Health (DH) and Monitor.

Monitor was established to administer the financial performance of all hospitals which had achieved foundation Trust status (*Doc analy Monitor 2016*). All three hospitals in this study were Foundation Trusts and were regulated by both the CQC and Monitor. It appeared that the aim of becoming a Foundation Trust was to have greater financial control for the decisions made within the Trust. One board member described it as “*achieving freedom*” from the powers of Government to make decisions for his organisation (*OBS notes site B BRD*).

CCGs were tasked with commissioning services during my study. Their selection processes appeared to have led to variation in the delivery of orthopaedic services across the three areas, and even distinct at hospital sites. I observed a diversity of services depending on commissioning plans in that area, as described in the field note below:

*“A triage service has been commissioned at site B so that patients first access a GP, then the triage team with a specialist physiotherapist and finally an orthopaedic surgeon prior to being considered for a hip replacement. A pathway to support this three-step process has been set up and agreed by the providers. The local CCG were supportive of this decision because it “provided more appropriate points of access and treatment for musculoskeletal patients.” (OBS notes site B Int).*

The commissioning approach appeared to cause problems for the staff who worked in, and were responsible for, individual departments such as the triage service described above. They reported being under “*constant pressure*” to justify their service in terms of achieving outcomes and targets, referred to during observations as “*delivering on the contract*”. This pressure was confounded by the need to ensure that they successfully re-tendered for the

work in competition with other providers (*OBS notes site B gen*). Even though patient care was important to the staff, phrases such as “*contact time*”, “*conversions*”, “*time to consultant*” and “*throughput*” were very much a part of everyday conversation between the staff during my observations, particularly amongst AHPs and non-clinical professions (*OBS notes site B gen*). The importance attached to the business of NHS practice was highlighted. The service lead at site B described her difficulty in setting up the initial contract as a “*big learning curve*” (*INT C 37012*).

Regulators were established to control market processes and to ensure that the health market operates for the benefit of the NHS patients. In line with this system, the DH established what was called a tariff so that hospitals could be paid according to the hospital activity they performed (DH, 20120). These national tariffs were a common topic of conversation across all three hospital sites. They appeared to be a driver of many decisions that were made by all the professional groups working in the hospitals. Therefore, the tariffs appeared to be accepted as a normal part of hospital business, and data in relation to tariff targets were reported against in many of the management meetings I attended at all sites (*Doc analy Mins*).

#### **7.2.2.1 Best Practice Tariff for hip replacement**

During the time of data collection, the National Joint Registry (NJR) in England was responsible for collating the data and determining the compliance of hospitals with the Best Practice Tariff (BPT) for primary hip replacements. In 2014, a new BPT called “*Primary hip and knee replacement outcomes*” was introduced (*Doc analy BPT*). In this new system, payment of the primary hip and knee replacements BPT was linked to data collected in the NHS England Patient Reported Outcome Measures (PROMs) programme and submitted to the NJR (*Doc analy BPT*).

The apparent aim of the BPT was to reduce the unexplained variation which exists between healthcare organisations according to surgery outcomes. For the hospitals to be paid the tariff they had to achieve the following targets for patient data collection:



*“A minimum compliance rate of 75% and an NJR unknown consent rate below 25% (where patient consent was recorded as a ‘yes’ or ‘no’), pre-op PROMs response rate of 50% or more and the provider achieving an average health gain that is not significantly below the national average.”*  
*(Doc analy Monitor 2015/16 National Tariff Payment System)*

These compliance ratings are linked to the delivery of services according to established clinical pathways. The pathways are intended to cover the pre-operative assessment, through to admission and post discharge. However, the actual pathways that were used in practice varied across sites A, B and C, for example site B had a triage service for patients prior to a surgical appointment. An excerpt from the pathway at site C for osteoarthritis (OA) of the hip is presented in Figure 9 for illustration; it includes the treatment for hip replacement (*Doc analy site C*). This pathway is simple and very linear, I observed the same situation at sites B and A. Pathways covered the basic practice that could be provided to patients, rather than describing the reality of services.

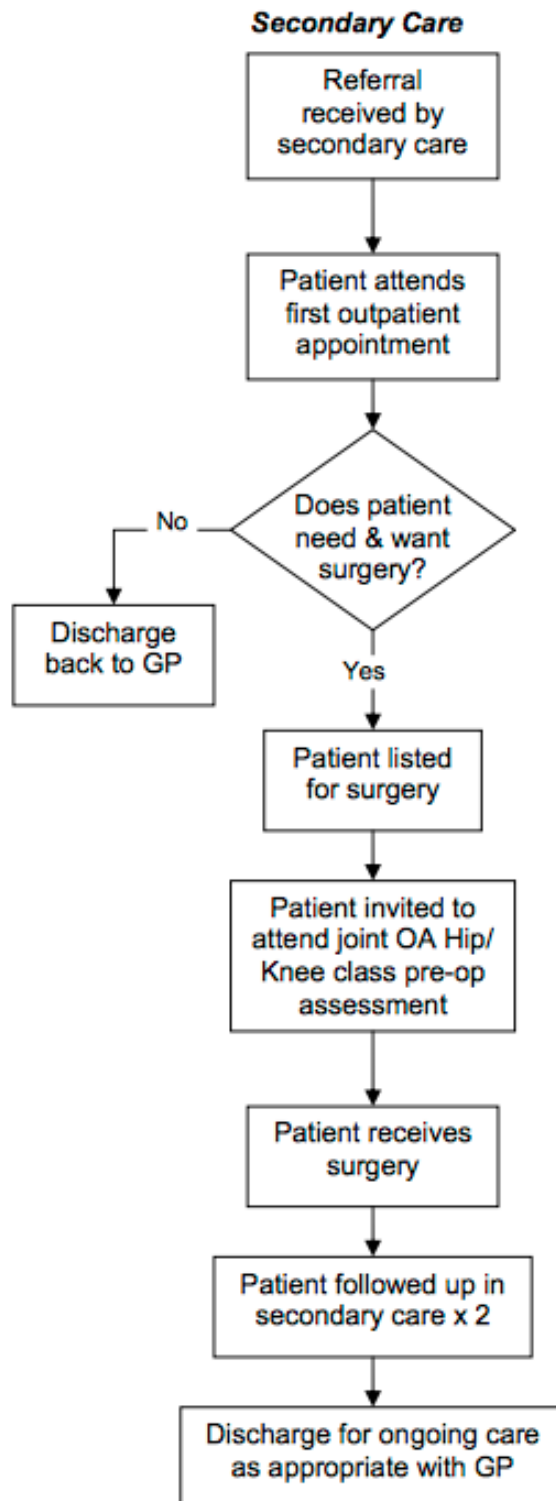


Figure 9. A segment of the OA pathway for hip replacement at site C

#### **7.2.2.2 Regulation and financial incentives**

Environmental regulation, set out in schemes such as the BPT, advocate for the timely and coordinated multidisciplinary care of patients. They aim to improve outcomes for patients undergoing hip replacement. However, the BPT appeared

to be very much associated with a financial incentive for hospitals in my study and all three hospitals were able to achieve the target (see Box 2). This was not the case for all hospitals across the country during the time of the empirical work. Implementation and achievement of regulation was variable, for example the NJR reported that 22 out of 144 hospitals did not achieve BPT compliance targets for 2016 (Jan-Mar) and three failed to achieve the consent targets (*Doc analys NJR 2016*), which meant that they would not have been paid the associated top up fees in that year.

The aim of the BPT is to standardise care. BPT is an evidence-based approach and, ideally, a hospital would design evidence-based services so that patient pathways are comparable to the 'ideal' BPT patient pathway. The findings of my study suggest that the reality of achieving this in practice across the three hospitals was small. The hospitals did not appear to be in a strong position to develop their patient pathways. A clinical lead working at site B, responsible for pathway development, described the experience as "*a quandary about who owned (it)*". She suggests that staff "*missed the bigger picture*" and treated it as another 'tick box' exercise (*INT C 37012*). On the whole, the interview data indicates that surgeons and healthcare professionals were broadly receptive to the idea of regulation and incentives such as the BPT, although surgeons were poor at completing the forms and lacked awareness of the costs of individual treatments. To a certain extent, this calls into question the ability of the BPT to incentivise evidence-based care amongst clinicians, although high compliance rates suggest that the targets were achievable and achieved in my case study hospitals.

#### **7.2.2.3 Hospital monitoring and the Care Quality Commission**

The CQC was established to regulate healthcare provision for England. This regulatory body was discussed on more than one occasion by administrative, managerial and clinical staff in all three hospitals (*Doc analys CQC*). Unlike the targets set out in the BPT, those defined by the CQC were not automatically tied to financial incentives for Trusts.

The requests made by the CQC were somewhat unpredictable and harder to plan for, compared to targets such as the tariff. Hospital inspections conducted by the CQC could be both announced and unannounced. However, the hospitals did appear to know when an inspection would take place and were asked to provide a significant amount of information to the CQC beforehand (*OBS notes site C gen*). This information was in addition to the regulatory data collected by the Health and Social Care Information Centre, the Royal Colleges, the CCGs, Healthwatch and the National Audit. Staff working in the hospitals had mixed attitudes towards the CQC and their inspections.

From the outside, it appeared that this type of regulation through inspection was counter-intuitive, and drove behaviour outside the normal day-to-day practice of the clinical, administrative and managerial staff and which was generally unrelated to mechanisms of knowledge mobilisation or use of evidence.

In their key documents, the CQC state that they:

*"Make sure health and social care services provide people with safe, effective, compassionate, high-quality care and we encourage care services to improve. We monitor, inspect and regulate services to make sure they meet fundamental standards of quality and safety and we publish what we find, including performance ratings to help people choose care."* (*Doc Analy CQC About us*)

The aim of their inspections is to answer the following five key questions listed in Table 14 which are used to evaluate services (*Doc Analys CQC About us*). The responses to these questions for sites A, B and C are presented in Appendix 6.

**Table 14. CQC's five key questions**

No.	CQC inspection question
1	Are they safe?
2	Are they effective?
3	Are they caring?
4	Are they responsive to people's needs?
5	Are they well led?

These lines of enquiry are investigated exhaustively from the wards to the

executive board and could be influenced by the data gathered during the pre-inspection planning. During an inspection, a multitude of topics are reviewed including care planning, risk registers and discrimination and equality of services amongst others. What was particularly important for my empirical work was that the CQC are expected to discover:

*“How are relevant and current evidence-based guidance, standards, best practice and legislation identified and used to develop how services, care and treatment are delivered? (This includes information from NICE and other expert and professional bodies).” (Doc anal National Health Executive, Hospital Inspections)*

During the interviews with the NICE guideline administrators, I was interested in understanding how this objective was achieved and the impact that it had on their work and everyday decision-making. The interview findings reported an element of *“chasing their tail”* to ensure that all necessary boxes were ticked ready for CQC inspections (*OBS notes site B gen*). Respondents varied in their descriptions of the processes each hospital used to respond to the CQC. These ranged from not knowing the requirements (site A) to having a formal policy (site B) and a specialised computer system at site C. Quotes are displayed in Table 15.

**Table 15. Participant description of the processes used to respond to CQC requests**

Hospital	Quote
Site A	<i>"I don't know the requirements (of the CQC). That's the honest answer. For me I think it would be if we didn't have some sort of policy and to show how we're looking at NICE, even, it's not all NICE guidance, it's not actually, other than TAs that are mandatory to be implemented, the other types of NICE guidance isn't, but we wouldn't look very good as a trust if we didn't. So, I think then when CQC, when inspectors come in, if we didn't have something like this in place how would we show the evidence and, you know, we need to show that we are adhering to the majority of NICE guidance I think." (INT A 218015)</i>
Site B	<p><i>"So this just goes through steps to implementing guidance, roles and responsibilities of all these people, and these are the appendix which I've also printed out for them (CQC). So these are the guidelines that we... So I try to pull out relevant standards from the guideline, it's quite a challenge really. And the NICE audit standards, I didn't find they always chose the right standards toward it, you know, or if they did, they still needed to be more...they weren't extensive enough always. So what have we got? For the CQC, you know about that visit, so this is what was implemented. NICE guidance process." (INT A 198002)</i></p> <p><i>"In fact, we've just had a CQC visit and they haven't mentioned NICE, have they? They mentioned National Audit but not NICE, for example. And that's a regulator, isn't it? (Laughs) They don't say, "You're not following NICE guidance," they'd probably say, "You're missing the National Audit Standards" or "You're... And they have a whole thing on effectiveness." (INT M 37003)</i></p>
Site C	<i>"So that took up a hell of a lot of time to sort. We've got a NICE database which is something that I... in my little pipedream that I've been doing this job I thought it would be really good to have this database so that when they say, "Oh CQC are coming in next week, send me all this stuff," and you're sending all this stuff via email, that you could just say, "Right, what would you like to see?" and this person would say, "Hmm, show me what you've got on depression in adults," you know, "What did you do on that?" So we'd press a button, it'd run a report and it'd show you the review, the audit, the action plans, you know, and it'd have everything there, you haven't got to sort of just forward millions of documents and stuff. But you know, you just need someone to just maintain these processes because, as I say, it's getting bigger and bigger." (INT A 119009)</i>

#### **7.2.2.4 CQC at the three hospitals**

During my time at the hospital sites, each was in a different stage of the inspection process. Ratings from these CQC reports are detailed in Appendix 6. One hospital was just about to receive an inspection (site A) and a second was being inspected during the period of observation (site B). The final site had not been inspected since 2013. Site A performed better on the effectiveness measure, and both A and B performed equally on safety, but overall both sites “required improvement” (*Doc analy CQC ABC*).

Whereas the BPT focuses data collection on quality measures and financial incentives, the CQC concentrates on the quality and safety of services. The main driver to achieve compliance with the CQC recommendations for healthcare providers is preventing civil enforcement action. The CQC’s enforcement policy describes the significant power they have over healthcare organisations, and hence why they are able to achieve such a level of control in this sector (CQC, 2015).

The power of the CQC to make changes to hospitals range from them formalising the organisation’s administrative details e.g., ensuring the hospital has an audit procedure, to restricting risky services or requiring that a hospital makes specific improvements. They also rank the changes that need to occur in terms of their urgency. For example, “*extreme issues*” can result in urgent cancellation, suspension or removal of services in hospitals (*Doc analy CQC*). These extreme issues are the stories often reported in the media when hospitals or wards are forced to close.

The CQC then monitors hospitals to see whether the concerns are ongoing, referred to as a “*systemic failing*” or something that can be dealt with by the hospital themselves (*Doc analy CQC*). As part of this improvement process, the hospitals are expected to find out whether they are compliant with the essential standards and where the gaps are and how they expect to resolve them. The additional work this process creates was described as a “*hugely disruptive force*” (*OBS notes site C AHP*). One surgical lead I interviewed revealed that a negative

inspection from the regulators actually benefited his practice and his organisation in the long run. He described how being an “outlier” was “uncomfortable” at first, but turned into “an opportunity to change things” (INT C 218008).

External regulation by organisations such as the CQC helps to explain the increased strain that many hospitals, including the ones I studied, are put under by the regulators during a period of inspection. It sets the context for the competing interests in play in a hospital at any one time. In the findings, it appeared that the demands associated with the process of regulation could not be ignored or postponed in the same way as others. Most staff seemed to recognise the relationship between this type of regulation and the organisational ability to survive. I observed the NICE administrators at site B privileging the CQC preparation over their normal daily tasks.

In the worst case, it is possible that monetary fines and public warnings are issued to hospitals which could damage their reputation. When this type of regulatory pressure is measured against the achievement of clinical guideline recommendations and evidence-based practice, it is clear that the balance may change. Priority will inevitably be placed on achieving the CQC’s must do’s before NICE’s to-do’s.

### **7.2.3 Environmental regulation in decision-making and knowledge mobilisation**

The findings revealed a discernable presence of the national targets and regulatory bodies in the three sites. The targets and standards established by the regulators appeared to drive behaviour and processes within the hospitals, although more so for the managerial staff than the clinical professionals. The power and control of different professional groups was played out differently within the three hospitals, and this had an impact on the evidence use and knowledge mobilisation for clinical practice.



### **7.2.3.1 Regulatory Influence on managers**

The regulatory power exerted from outside the organisation appeared to restrict the service improvements that mid-level managers were able to achieve in practice, for example in monitoring quality standards established by NICE. As discussed in Chapter 6, managerial knowledge in this study was tied to meeting the internal pressures and demands acting on the hospitals. This included pressure from organisations such as NICE, but can be expanded to include the external regulation described in this chapter. It appeared that external regulation could be repackaged and sanctioned internally, therefore mobilising knowledge from policy-makers into practice.

### **7.2.3.2 Regulatory influence on clinical professionals**

Orthopaedic surgeons as professionals had an obligation to their profession which helped validate their privileged status in the three hospitals. The findings demonstrated that, unlike managers, the surgeons in this study did not need to rely on organisational bureaucracy to exert power and hold discretion over decisions. Professional hierarchy appeared to be particularly important to their practice. The specialist knowledge of surgery is enduring and in many respects, superseded the managerial and organisational knowledge located within each of the hospitals. The distinction between what type of knowledge was privileged appeared to work against the traditions of evidence-based decision making. The notion that *"NICE guidance simply is something you use as a stick to beat the person with"* (INT C 37003) demonstrates its association with the activity and responsibility of the hospital managers, and therefore not in the surgeons' domain.

This relationship is in contrast to that which I observed between the surgeons and their professional regulators. It was apparent that the professional bodies and the GMC were able to exert control over the clinical professionals and their decisions. A surgeon told me how he *"needs to be prepared for the likelihood that I will be subject to at least one investigation"* (INT C 198005) due to the fact that he performed highly specialised hip replacement operations with non-standard implants. The apprehension regarding regulation and sanction from the GMC was not something that the hospital level regulation or hospital hierarchies were

able to achieve to the same extent. The findings therefore suggest that managers and clinical professionals may struggle to develop relationships and work in the same knowledge space to achieve targets and standards, because they operate under different professional and regulatory powers.

#### ***7.2.3.3 Attempts to shift the balance of power***

In the literature review, I described the increasing presence of managers and the managerialisation of healthcare. The data revealed that this might have fostered conflict between the work of clinical professionals and managers, and therefore may have reduced knowledge sharing. However, regulation (e.g., CQC) might potentially act to achieve better balance.

In my findings, there was a clear distinction between the practice and decision-making of clinical professionals, and that of the managers responsible for the achievement of organisational regulation. This remained a persistent thread in the data as clinical practice appeared to be protected work of the surgeon, everything outside of this could potentially be management work. It did not appear to be ring-fenced in the same way, as the clinicians had their distinct regulatory responsibilities whereas the managers took on whatever was left. The meaning of management was ambiguous and intangible. The findings were unclear regarding where the boundaries lay between the responsibilities of hospital managers and the environmental regulators in relation to regulation, or where each of the three professional groups thought they should be.

#### ***7.2.3.4 The hospital as a business***

The three hospitals were large multi-divisional organisations controlled by executive boards, where purchasers and providers negotiated processes and agreed contracts, for example with the implant manufacturing companies. This corporate element of practice also had a strong presence in the data. An example of business activity during my study was the implant rationalisation process I described in earlier. This appeared to have been driven by the management teams but did not appear to have been driven by regulation over implants, for example ODEP evidence ratings. It seemed as though the cost reduction requirement promulgated by NHS England was the main factor in this process. The existing contracts between the manufacturers and the hospitals were being

negotiated with both the CCGs and the implant manufactures by the management, on behalf of surgeons. A surgeon recognised the changes as “*a Trust decision*” rather than a clinical decision (INT C 37011).

The findings from all three hospitals appear to predict that the clinical professionals needed to become accustomed to functioning within these wider strategic and budgetary frameworks. This move towards business thinking and regulation appeared to have been accompanied by an abundance of managers and industry executives who have entered into healthcare with a remit of organising and running the hospital as a business. However, it seemed that only one of the three hospital sites had really embraced this move to treating the hospital more like a business. During interviews I conducted at site A, participants discussed “*running it as a business*” and making “*cost savings*” which demonstrates their awareness of the changes (INT M 218014), (INT C 218011).

At sites B and C, on the other hand, I found little evidence of clinical staff working towards this new model of healthcare delivery. Instead it appeared that they would try to resist managerial influence by actively criticising and buffering change (site B) or trying to ignore it and hope that the ‘trend’ faded (site C). These clinicians seemed content with providing the services they were used to providing.

### **7.3 Summary of the theme**

Throughout my empirical work, multiple environmental regulators were mentioned in the interviews, observations and documentation. These included both government regulators whose focus appeared to be within the realm of management, and the specific healthcare regulators whose responsibility is to monitor the practice of orthopaedic surgery as a clinical profession. Targets and standards set by regulators were linked to incentives or disincentives for the three hospitals (for example the BPT rewarded the hospitals for increasing their productivity, and therefore should have encouraged them to improve efficiency with stricter control of costs). However, the anticipated response to the incentives was not necessarily the case in the hospitals I examined.

Linking targets and standards to financial incentives or penalties is often referred to as 'pay for performance' and has been the focus of academic research (See Campbell et al, 2009). The findings of this study revealed that the impact of financial incentives and regulation designed and enacted at the environmental level were influenced by the individuals and groups working in the organisation. It appeared that clinical staff, especially orthopaedic surgeons working in a hospital, needed to be able to understand the costs and benefits of a business or operational approach such as the BPT. Throughout this chapter I have presented data to suggest that this may not be the case for two reasons.

Firstly, the clinical professionals in my study tended to view regulation as a management responsibility, and therefore outside of their clinical knowledge domain. The consequence of this interpretation for my study was that targets, protocols and standards could be avoided. Their priority for practice appeared to be reduced in comparison to the privileged clinical work. The clinical professionals were also unclear about the cost and quality of treatments and how they related to payments, regulation and fines. In situations such as this, where costs are ambiguous or intangible, incentives grounded in increased revenue for the entire organisation may have a smaller impact than incentives paid directly to individual surgeons or orthopaedic departments.

Secondly, administrative staff were more likely to be given the task of data collection for regulation in the three sites. Through the interviews and observations, these staff groups appeared to be unaware of the consequences of not collecting or adequately recording accurate data that could impact on regulatory targets and standards. More importantly, the administrators and managers reported not being able to challenge the clinical professionals regarding the data collection. This represents the lack of knowledge mobilisation from regulators and managers to other professional groups in the hospital regarding the costs and benefits of interventions, and thus ensuring they have a suitable practice in response to external regulators.

At the time of my study, national organisations such as the CQC, Monitor and NICE were governed with the responsibility to reduce variation and improve the quality of healthcare organisations. However, the challenges and contingent nature of regulatory responses by the three hospital sites reflect the problems of attempting to prioritise external demands and pressure, over and above those faced 'on the ground' by individuals, professional groups or specific hospital organisations.

Knowledge mobilisation and evidence-based decision-making can be viewed as conceptual or theoretical problems. However, in my findings, they represented real-life knowledge problems because I identified distinct types of knowledge that appeared not to be assimilated and absorbed in practice. Some knowledge types were brokered or privileged over others depending on the requirements of the regulators at the time.

Each professional group had different regulators and their importance to practice was inconsistent across the three hospitals. In the hospitals, knowledge mobilisation was seen as a practical problem to be solved by 'management' through specific changes using a practical approach, for example one hospital developed a NICE database which could generate reports for the CQC inspection (site C). These practical approaches helped in some way to make knowledge meaningful and relate it to the real-world practice of healthcare where services were complex and messy. However, the data suggests that the likelihood of finding a common ground for valuable and effective knowledge sharing around regulation as standardised practice across professional groups is limited.

In this chapter I have presented the final level of analysis in my study. I have described the influence of the regulatory environment for orthopaedic surgery and healthcare more generally. The next chapter is the discussion where I will summarise the broad findings of the research to demonstrate how I have answered my research questions.

## **8 Discussion**

### **8.1 Introduction**

In this chapter I summarise the research findings and the answers to the research questions. I discuss my overarching themes, my contribution to knowledge and the strengths and limitations of my research. Finally, I consider the implications of my findings for policy, practice and research.

### **8.2 The evidence and knowledge literature**

My research spans the disciplinary boundaries between clinical and organisational sciences as I investigated EBM and knowledge mobilisation in healthcare. Specifically, I explored how evidence and knowledge influenced the decisions made in the practice of orthopaedic surgery in the NHS.

#### **8.2.1 EBM and clinical guidelines**

Healthcare policy in England is founded on EBM and encourages clinicians to use health-related scientific evidence in clinical practice (Sackett et al, 1996; Niessen et al, 2000). Policy-making organisations such as NICE use research evidence to establish national priorities, create guidelines and make decisions based on equity and cost-effectiveness (NICE, 2017). Approaches to EBM and guideline development have developed and expanded the boundaries of what evidence-based practice encompasses (Kelly et al, 2010).

In the NHS, evidence-based policy is exemplified by NICE guidance and clinicians and healthcare organisations are encouraged to implement evidence in practice. However, the complexity of the NHS has meant that the linear dissemination of guidance is not sufficient to change behaviour and reduce variation (Dopson et al, 2001; Greenhalgh et al, 2014; Every-Palmer and Howick, 2014). Too often, guideline implementation is characterised by a top-down approach and evidently there is still disparity in NHS practice and spending (Davies et al, 2000a).

### **8.2.2 Knowledge and knowledge mobilisation**

To overcome these challenges, researchers have investigated approaches to improve evidence use in practice (Dopson and Fitzgerald, 2005). One approach is to encourage effective knowledge mobilisation by individuals and organisations (Crilly et al, 2010). In healthcare, knowledge and evidence are often perceived as one and the same (Nutley et al, 2007). However, they are contested concepts in both the literature and in practice. Distinctions are made between individual tacit knowledge e.g., what we 'know' and 'do', and explicit clinical knowledge in evidence-based guidelines (Nonaka, 1994; Orlikowski 2002). Weight attached to tacit knowledge is problematic for EBM, where context is removed in pursuit of RCTs (Davies et al, 2000a). Dopson and Fitzgerald (2005) demonstrated the need to understand the context-dependent nature of healthcare to explain differences in the way decisions are made.

The problem with clinical guidelines is that they do not automatically align to evidence and knowledge as defined by clinicians. The inherent complexity and context dependant nature of practice means that it becomes impractical to prioritise one type of knowledge over the others. Research demonstrates that professionals define evidence differently (Swan et al, 2012). Clinical guidelines might represent one type of evidence accessible to healthcare professionals, but do not reflect the practice-based pragmatic evidence that is available. Therefore, guidelines contribute towards, but cannot explain, all the knowledge that influences decisions. Variation occurs in practice when other sources of evidence and knowledge drive decision-making.

I used the lens of knowledge mobilisation to identify what constitutes evidence and knowledge for clinical decision-makers in context, and how EBM is mobilised in practice. I investigated how many factors across the knowledge domain interact to produce a system where there is variation from guidelines despite continued effort from policy-makers to instil their use in practice.

### **8.3 Research aim, key findings and summary of themes**

The aim of my study was to assess the role of EBM in orthopaedic surgical practice decisions. In fulfilling this aim I discovered that:

Variation from evidence-based guidelines played out according to how each surgeon brokered the wider sources of evidence to deal with the contingencies and constraints inherent in orthopaedic work. Surgeons privileged other sources of evidence and knowledge which were mobilised differently by individuals, groups and organisations, all functioning under the assumed control of the regulatory environment. Pragmatic mechanisms by which knowledge is mobilised in surgery gave more weight to professional networks and communities of practice (CoP) to which surgeons belonged. This understanding helps to explain why orthopaedic surgeons do not always use evidence in their decision-making.

The key findings of the research include:

- Identification and description of the sources of evidence and knowledge used in orthopaedic practice
- Illustration of how the brokering and mobilisation of knowledge and evidence contributes to variation
- Three case studies which produced four themes reflecting the levels (individual, group, organisational and regulation) at which evidence and knowledge were enacted in practice:
  - Decision-making varied according to differing beliefs and approaches regarding how a wider 'evidence' base was privileged by individual decision-makers in context
  - Contingencies of practice and environmental regulation impacted on which type of 'evidence' was selected
  - Organisational constraints and established approaches to knowledge mobilisation in the NHS restricted evidence-based decision-making.

### **8.3.1 Summary of themes**

My four themes represent the levels at which evidence was used and knowledge was mobilised in practice. They reflect the complexity of knowledge mobilisation in a highly professionalised organisationally-regulated context.

The themes characterise:



- Individual decision-making of surgeons
- Groups and networks that exist in hospitals
- The hospital as an organisation
- The regulatory environment of the healthcare sector.

I demonstrate that evidence-based practice was not always possible or preferable in the three cases. Individual surgeon characteristics, beliefs and values differed, as did the meaning of evidence for the surgeons, managers and administrators making decisions in hospitals. The socialisation of distinct professional groups was important as it influenced the process of decision-making and the different assumptions that were central to decision outcomes.

These issues are important to consider in the development, presentation and dissemination of evidence-based guidelines. The organisational capacity of each hospital was crucial in their ability to achieve, or not achieve, effective knowledge mobilisation. This impacted their capacity to ensure the most clinically and cost-effective procedures are selected to treat patients.

## **8.4 Summary of the research questions**

This section demonstrates how the three research questions have been answered:

### ***RQ1. What types of evidence and knowledge are considered important by orthopaedic surgeons when making clinical practice decisions?***

The mixed methods systematic review identified variation in the approaches and techniques for evidence use in decision-making. I discovered various types of evidence and knowledge that influenced clinical decisions. These included external evidence created by healthcare regulators, e.g., CQC and GMC, the influence of the media and ‘the press’, evidence from the knowledge of managers, organisational knowledge that exists in hospitals, e.g., cultural norms and processes. Evidence came from the structure and location of the hospital, evidence from implant manufacturing companies, knowledge gained through

socialisation and association with colleagues and evidence from the professional hierarchy. The opinions of leaders and professional societies, training and informal education and evidence linked to the innate 'feel' of surgery were also considered important. Finally, informal experiential knowledge and knowledge gained from individual patients and surgeons were important. These were categorised and presented in a conceptual framework (see Figure 10).

***RQ2. How are evidence and knowledge mobilised in the real-world practice of orthopaedic surgery in the NHS?***

Case studies generated a comprehensive understanding of evidence and knowledge sharing in professionalised organisations. The findings revealed that all surgeons performed 'evidence-based' decision-making. However, they applied a wider definition of 'evidence' than anticipated in traditional EBM. Research evidence was only one form of evidence and knowledge considered useful in context. Interviews and observations of practice allowed me to explore what evidence meant to surgeons, and therefore what this wider definition of evidence represented.

Variation in practice was a consequence of how evidence was defined and privileged by surgeons, staff and entire hospitals. I identified that multiple levels of practice interacted and impacted on how knowledge was identified, adopted, integrated and mobilised in surgical work. Levels included the individual, group and organisation, which were considered alongside the contingencies of practice and the overarching effect of environmental regulation prominent throughout my study.

***RQ3. What are the key dimensions of knowledge mobilisation which influence variation in decision-making in the orthopaedic surgery NHS environment?***

I identified three key dimensions which influenced knowledge mobilisation and hence variation in decision-making. These were the individual surgeon

characteristics (gold-standards, mavericks and innovators), the socialisation of medical professionals and the organisational capacity of the hospital. I explored how these were enacted across all three levels as surgeons deal with the contingency in their work and make decisions in the presence of regulation. The dimensions represent potential areas for improvement in how evidence is presented and disseminated across the NHS orthopaedic surgery environment. My research has indicated that 'evidence' in real-world practice is multifaceted and contextually contingent, therefore traditional linear codified approaches are not appropriate. I have signified the need to tightly define the type of evidence and approach to knowledge mobilisation which interventions are trying to achieve, when focused on individual clinicians, professional groups or organisational capacity issues.

## **8.5 Extended case profiles**

In Table 16 I discuss the important discoveries from the three case studies. I briefly describe their overarching approach to knowledge mobilisation. Generating this narrow focus was essential to understanding the dynamics present in single settings (Yin, 1884). However, comparison across cases was essential to look beyond my initial impressions and see my findings through multiple lenses. This generated key dimensions regarding the relationship between knowledge mobilisation and evidence that are described in the next section (Eisenhardt, 1989).

**Table 16. Case study description and their approach to knowledge mobilisation**

Case	Description and approach to knowledge mobilisation
<p><i>Case A: 'beyond' EBM decision-making</i></p>	<p>Case study site A was specifically designated as an academic orthopaedic department. It was an orthopaedic trauma centre in a Foundation Trust, linked to an Academic Health Science Network. The orthopaedic department had an ongoing working partnership with the local University Medical School, which had a satellite campus within the hospital. It was also responsible for the training of junior surgeons because of its status as a teaching hospital. In this department, there was an integrated clinical academic training scheme for orthopaedics. Therefore, most orthopaedic surgeons working in case A had some basic training in EBM, or had gone on to complete post-graduate studies including MDs or PhDs. The research teams in site A were led by Professors of Orthopaedic Surgery who conducted effectiveness and cost-effectiveness studies, mainly national RCTs, of various orthopaedic techniques and treatments. Many of the surgeons held joint academic-clinical posts at the Trust and at the University.</p> <p>Case A's overarching approach to knowledge mobilisation was that evidence-based decision-making was suitable, but not sufficient for their practice. The surgeons working here went 'beyond' traditional EBM and focused on pragmatic EBM. This practice-based approach to EBM considered the important point that knowing what to do, how to do it, and the likely outcome of an orthopaedic intervention was only part of the knowledge picture, to which research contributed a small portion. This site, more than the other two, appeared to have a positive view of NICE guidance and what it set out to achieve in the healthcare sector. Some surgeons working here had even been involved in guideline development groups for policy-makers. However, case A demonstrated how macro policy initiatives from organisations such as NICE, competed with the reality of frontline delivery of orthopaedic services.</p> <p>Contingent factors acted as additional sources of evidence that influenced clinical decisions within this site. Research and the findings from RCTs were not the only knowledge domains to be considered. The managerial, organisational and regulatory constraints were important, and the surgeons appeared to work within a restricted framework or practice. In general, case A had strict limits placed on the hip implants that could be used during operations. This was a direct consequence of the rationalisation of services due to cost. However, there was some scope for variation under the remit of innovation and research. For example, surgeons working here altered their immediate practice due to the findings of one of their RCTs. What mattered in site A was that knowledge could be mobilised from policy or research into practice, but it had to fit within the existing organisational frameworks and decision-making processes to make it useable.</p>
<p><i>Case B: 'it depends' approach produced by the binary characteristics</i></p>	<p>Case study site B was a small District General Hospital Foundation Trust with a specialist practitioner triage service. The distinguishing feature in Case B was that the hospital functioned as two split sites (B1 and B2). The services were separated across two hospital buildings which were approximately 20 miles apart. The physical divide in location appeared to foster a divide in approaches to knowledge mobilisation which I observed. There was an 'it depends' approach to decision-making by the two seemingly independent orthopaedic departments.</p> <p>Case B was not affiliated to an orthopaedic academic department or University, and was not a teaching hospital. It represented a standard orthopaedic department and the clinical team provided general orthopaedic treatments to the local population. It was supported by a group of designated Allied Health Professionals. This group provided a specialist musculoskeletal assessment interface between General Practitioners, patients and the orthopaedic department.</p> <p>The evidence used for decision-making in Case B appeared not to originate from research or the findings from RCTs. Regulation and guidelines from NICE were also not privileged as sources of evidence, and they were often considered in a negative light. What mattered for case B was the dynamics of</p>

	<p>organisational change and leadership in the two orthopaedic departments. The characteristics of the individual orthopaedic surgeons and the binary characteristics of the groups of surgeons working at each site meant that knowledge mobilisation across the organisation was difficult.</p> <p>Surgeons at sites B1 and B2 made decisions that were influenced by historic organisational ways of working, and by the beliefs and practices of the surgeon 'in charge'. This was emphasised in my findings through the process of rationalisation of hip implants which took place during my study. The distinct groups appeared to struggle to work together and share knowledge. This was because the specific contexts that clinicians were socialised into differed at each site. This socialisation reflected the behaviour and norms that guided or regulated the action and decision-making of individuals, for example sites B1 and B2 had different norms regarding their professional hierarchy. The development of the multidisciplinary team in the specialist-practitioner triage service went some way to addressing the difficulties at one hospital. The staff working here had experience of planning and delivering different service designs which had required the various professional groups to work together. However, this was not the case at the other hospital where the routine separation between professional specialties and departments endured.</p>
<p><i>Case C: 'socialised decision-making'; evidence was discretionary</i></p>	<p>Case study site C was a large orthopaedic department in a teaching hospital Foundation Trust with a specialist trauma centre. Unlike site A, it was not a designated academic orthopaedic department with a specific clinical academic training scheme. However, it was one of the largest orthopaedic surgery units in the country and conducted many specialised hip implant revision operations. Site C was a teaching hospital and therefore only had a small academic team that carried out research, development and training. The clinicians working here decided to participate in academic work depending on their own capacity and personal preferences; it was not the departmental norm as was the case in site A.</p> <p>Case C appeared to be a closed orthopaedic unit. It was closed to the influence of administrators and managers working in the Trust, and closed to pressure from external policy-makers. It seemed to be closed to knowledge mobilisation from 'outside'. There was a defined 'inside' group of surgeons who had been working in the hospital for their entire careers who were relatively separate from 'outside knowledge'. What mattered for case C was that decision-making practice was socialised. The importance attached to evidence from 'outside' was up to the discretion of the group members. In case C, the NICE guidelines might be deemed important for decision-making or not. Knowledge from policy-making organisations had to compete with the complex social systems that existed in the hospital, although there was a wide range of political, individual psychological and organisational factors which were influential to decision-making across all of the cases.</p> <p>'What worked' for this discrete group of surgeons in case C appeared to take precedence in the decision-making process. Definitions of 'what worked' were grounded in the experience of surgical work in practice, and legacy knowledge about the organisational functions that had developed as a consequence of working there for a long period of time. Also important for case C was the knowledge mobilised from senior to junior orthopaedic surgeons. This behavioral modeling via the professional hierarchy appeared to influence decision-making of junior surgeons, who then went onto do what 'my consultant' did. The growth of research activity in case C, and the focus and priority it had over practice, was adapted to the needs of the surgeon group, rather than something that might be imposed on them from the outside.</p>

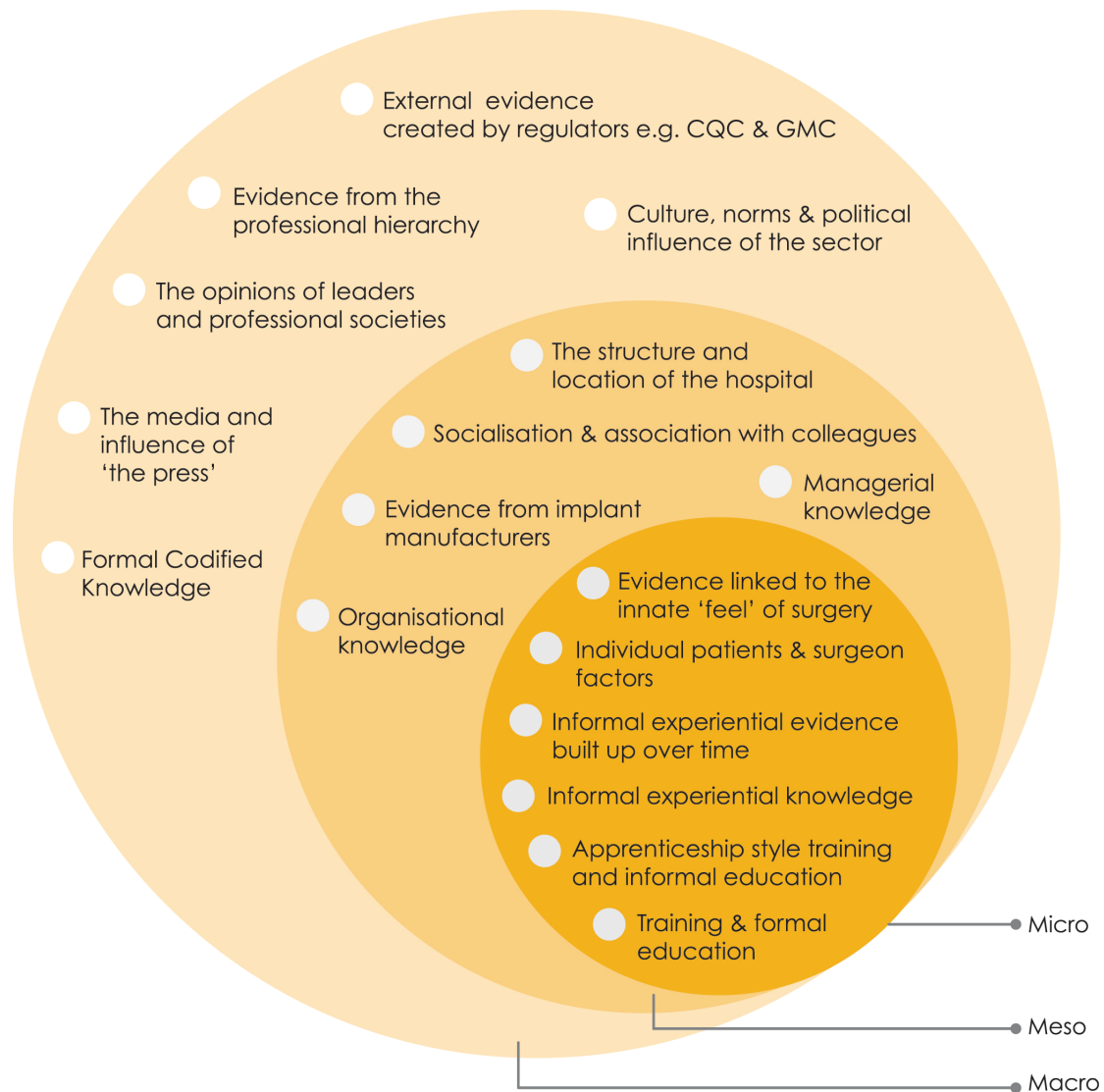
## **8.6 Key dimensions for EBM and knowledge mobilisation in orthopaedic surgery**

This section provides a representational picture of knowledge mobilisation and the privileging of evidence that took place throughout the study. I discuss the findings from the case studies and then draw on these to provide a theoretical explanation of variation in practice of decision-making for orthopaedic surgery.

### **8.6.1 Summary of empirical findings**

I conducted case studies using mixed qualitative methods to identify how evidence is assembled, understood and mobilisation in decisions for the treatment of patients receiving hip replacement surgery. The mixed methods used in each case (interviews, observations and document analysis) enabled me to observe first-hand the social, cultural and knowledge context of evidence use in the NHS hospitals. The cases may not reflect the entire knowledge mobilisation process but present a snapshot of what occurred in the hospitals when my study was conducted. Figure 10 presents the sources of evidence and knowledge identified in the context of practice.

My overarching discovery is an understanding of how a more inclusive definition of evidence is required in orthopaedic surgery. This wider definition allows me to appreciate how decision-makers in context privilege various sources of evidence and knowledge differently. What was important to the decision-maker was not always evidence-based guidelines. It could equally be any type of evidence or knowledge that was identified, interacting with the contingencies of practice and the pressure from environmental regulation.



**Figure 10. Sources of evidence and knowledge identified during the case studies**

The different types of evidence and knowledge were mutually exclusive and the process of privileging one over another in a contextual hierarchy of evidence was flexible and adaptable. Figure 11 presents an empirical summary of the research and displays the diverse types of knowledge identified during my study and how they interacted in context. It demonstrates the three key dimensions for 'evidence' based decision-making in my research:

- Individual surgeon characteristics
- Socialisation of medical professionals
- Organisational capacity of the hospital

Regulatory forces were enacted on individuals, groups and organisations equally. The findings did not show that one level or one case was influenced by regulation more than any other. The distinguishing features were how the individuals, groups and organisations influenced the brokering of knowledge and evidence for practice in the context of regulation. The interaction and privileging of evidence at each site impacted on the decisions that were made.

This dynamic approach to the mobilisation of evidence and knowledge generated variation in decision-making processes. For example, in Figure 11 the larger size of Case A's 'organisational capacity' circle signifies the importance of this dimension in this site. Decision-making here was dominated by the organisational capacity of the hospital to practice and promote EBM. This was reinforced and maintained by surgeon groups who worked together in a socialised environment where EBM was the norm. Case B differed: organisational capacity had limited influence compared to the dominant force of the distinct surgeon groups and the socialisation of the professionals in the two hospital sites (B1 and B2). At Site B, the surgeons remained at the top of the professional hierarchy and managers and administrators had little authority over decisions. Case C varied again, but aligned more to Case B than A. Here, surgeons led decision-making and established the importance attached to different types of evidence and knowledge. There were significant individual surgeon characteristics at site C, but the knowledge of the entire group as a CoP dominated. The capacity of this organisation to promote evidence-based decision-making was limited because an orthopaedic 'insider-outsider' dynamic prevailed.



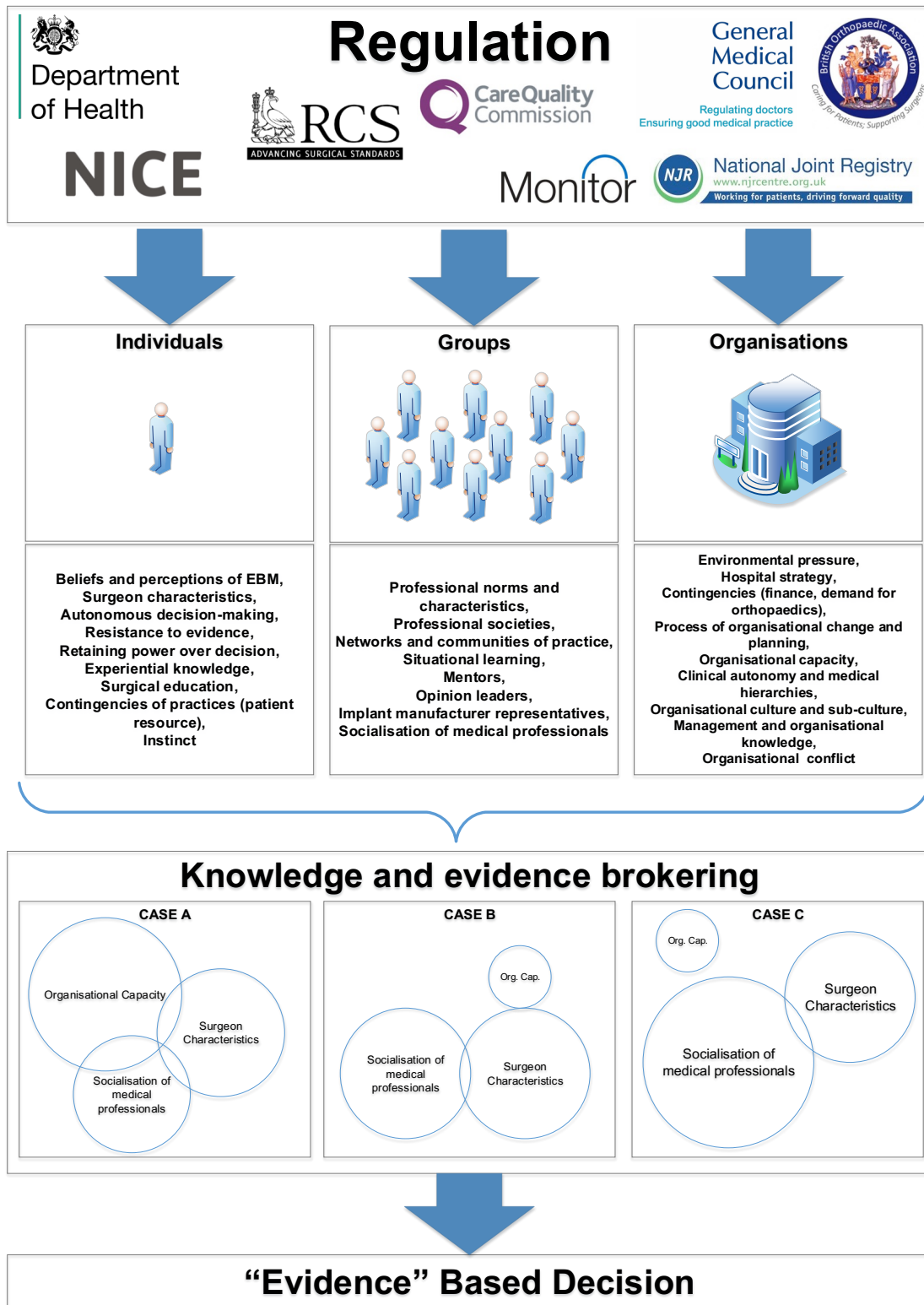


Figure 11. The process of knowledge mobilisation into 'evidence'-based clinical decisions

## **8.7 Key dimensions of knowledge mobilisation**

In my study, three key dimensions were identified which drove variation in evidence-based decision-making for orthopaedic surgery. In the literature review I introduced theories from knowledge mobilisation which focused on individual mindlines (Gabbay and LeMay, 2004;2011), groups in Communities of Practice (Lave and Wenger, 1991) and those linked to organisational boundaries, and capacity (Carlile, 2002;2004, Cohen and Levinthal, 1989;1990, Zahra and George, 2002). In this section I discuss the relationship between these existing theories and the key dimensions of knowledge mobilisation found in this study.

### **8.7.1 Individual surgeon characteristics**

A strong influential factor for decision-making was the individual beliefs that surgeons hold about evidence and knowledge. This included their beliefs regarding what constitutes evidence in practice, e.g., RCT evidence or experiential knowledge. In Chapter 4, I described three characteristic surgeon types which represented stereotypical types of surgeon in my study (gold-standards, mavericks and innovators). I collected examples of characteristic types of decision-making across all three cases.

Each surgeon type displayed characteristic methods for knowledge mobilisation and privileged different forms of evidence and knowledge in their decision-making processes. Gold-standard surgeons privileged EBM and standardisation in their practice. Maverick surgeons considered retrospective investigations of their own practice important as they valued their own experience and that of opinion leaders, above other forms of evidence. Innovators wanted to move the specialty forward through innovation in surgical techniques and devices. However, I found uncontrolled innovation that was not evaluated in the context of clinical trials and was therefore considered dangerous by other surgeons.

Surgeons selected and privileged knowledge in different ways which played out in how they functioned as a group and within the larger organisation. The anticipated, and actual, differences between the decision-making of the three surgeon types could have led to variation in practice. The influence of characteristic patterns of behaviour has been identified in previous literature

(Fisher et al, 2010). This implicit impact on decision-making practices was evident throughout the findings. It required an understanding of a network of factors that were amalgamated in the head of the surgeon and weighed up against each other. This process was described by Gabbay and Le May (2004) as the development and use of clinical mindlines. Mindlines demonstrate a more flexible, complex, and adaptable approach to evidence and knowledge compared to clinical guidelines because they are produced bottom-up by individuals. This would suggest that mindlines can better absorb change and become fit for purpose in a way that guidelines never will (Sausman et al, 2016).

However, my findings revealed that mindlines were important but not sufficient in understanding the entirety of knowledge mobilisation in orthopaedic practice. The surgeons' mindlines were ultimately controlled by the local organisational demands and environmental contexts. For example, the constraints of orthopaedic practice around hip implant purchasing restricted the surgeons' ideal choice of implant. Throughout the study, I gave examples of situations where the characteristics of the surgeon and their mindlines were undermined. Therefore, I demonstrate the importance of viewing each key dimension for knowledge mobilisation in the context of the other two.

### **8.7.2 Socialisation of medical professionals**

The distinct occupational norms between the different professional groups in my study appeared to drive variation in decision-making practice. Groups of orthopaedic professionals shared specialised knowledge of surgery, and collective tacit knowledge of what it meant to be a surgeon working in their particular organisation (Borg Anderson, 2009). This was different from the knowledge possessed by non-surgeons working in the same environment.

The surgeons' job title and identity enabled them to distinguish themselves, their norms and knowledge from that held by other groups. The significance attached to professional identity has been described previously (Mosher, 1968; Roberts and Dietrich, 1999; Freidson, 2001). Surgeons were able to assert control and authority over surgical decisions because they believed they possessed the expert knowledge. They were also more inclined to privilege knowledge and

evidence that came from professional societies over and above that presented in NICE guidance. It was as though surgeons had an innate sense of belonging to the societies which made the transfer and adoption of knowledge from these external organisations easier to achieve. Evidence enacted through NICE guidance was viewed as imposed from 'outside' and therefore existed in a different knowledge space. A similar boundary was found in the weight assigned to knowledge and evidence from orthopaedic opinion leaders, and has been reported elsewhere (Hiss et al, 1978; Jamtvedt et al, 2006).

In the literature review, I introduced the theory of Communities of Practice (Lave and Wenger, 1991). This theory was fundamental to explaining the knowledge mobilisation that occurred between the groups of surgeons in my study. CoP theory suggests that in order to absorb and mobilise knowledge, the person who is acquiring knowledge needs to do more than observe a group in action. Instead, they learn via active participation and by absorbing and being absorbed into the context and culture of a group (Lave and Wenger, 1991). In my study, I found that over time, the contexts and cultures of the groups became embedded in the hospitals, and the individual surgeons could intuitively understand what it was to be part of their particular community.

The formation of a CoP was an important component of the 'socialisation of professionals' dimension (Lave and Wenger, 1991). Each CoP had its own sociocultural practices which were identifiable in each hospital. Surgeons became members of a CoP by developing and mastering the knowledge and skills of their particular community, e.g., EBM at site A. This process of knowledge mobilisation moves away from the traditional model of medical education and training which is grounded on knowledge acquisition through passive learning and observation of senior colleagues.

The surgeons in each CoP were able to interact with their colleagues using their understanding of the contingencies of their practice to produce knowledge that was easily shared within their group. This facilitated evidence sharing between group members as surgeons had a shared language and understanding of what

evidence meant to them. Therefore, the environment into which they were socialised was important for decision-making. It could be a small CoP operating within a hospital, but also a larger CoP which formed around particular interests. Each CoP helped to create the norms which guided decision-making and the privileging of evidence for the members. More importantly, the CoP put boundaries around 'what' evidence and 'whose' evidence could be considered important. This restricted access and knowledge sharing with other professional groups, such as the managers and administrators. The norms of practice enabled surgeons to retain autonomy and power over their surgical knowledge to restrict the influence of managers and administrators, therefore limiting the impact of evidence-based guidance in their practice.

### **8.7.3 Organisational capacity of the hospital**

Organisational capacity reflects the impact each hospital had on the mobilisation of knowledge within their organisation. Decision-making was strongly influenced by the ability of each organisation to identify, integrate, transform and use knowledge in practice. The contingencies, constraints and functional structures of practice influenced the evidence-based decision-making that took place. These included the financial status of the hospital, technical resources available, the power of management and governance, and the presence of organisational processes.

In Chapter 2, I described different types of knowledge boundary which have to be crossed to achieve knowledge mobilisation in organisations. They include, *syntactic*, *semantic* and *pragmatic* boundaries (Carlile, 2004). I found examples of each type in my study and they were critical in the mobilisation of knowledge across the organisation. In my study, the boundaries could be characterised by their functional area, e.g., around hip surgery or specialised revision surgery, the problem being solved, e.g., a cost reduction project or a quality improvement project, or by a particular working practice, e.g., physiotherapy versus medicine. As anticipated in the literature, *syntactic* boundaries were the easiest to cross because the surgeons shared a common set of ideas and values regarding the process of decision-making in their surgical context (Carlile, 2004).

*Semantic* boundaries were slightly more challenging, as described in the findings individuals working on either side of a semantic boundary (e.g., non-clinical managers vs. clinical managers) did not share the same identity or values which led to differences in interpretation and understanding of information contained in clinical guidelines. In my study, *pragmatic* boundaries between the different professional groups were almost impossible to overcome. The surgeons, managers and administrators failed to work across pragmatic boundaries to achieve effective knowledge mobilisation within their organisation. Instead, mobilisation occurred between individuals or within distinct professional groups. To improve knowledge mobilisation, the groups needed to develop a common ground where some understanding is shared to enable joint work. However, this was not easy to achieve as individuals and groups were invested in their own ways of thinking and behaving and knowledge sharing was restricted.

It may be possible to overcome a lack of knowledge sharing in an organisation by improving the organisations absorptive capacity (ACAP). This theory describes the ability of a hospital to identify, integrate, transform and use knowledge in practice (Cohen and Lenventhal, 1989; 1990; Zahra and George, 2002). In my study, the biggest challenge to ACAP was the integration of new external knowledge into the hospital. Knowledge was ignored or minimised, rather than identified and integrated into practice. Unless evidence and knowledge use was enforced via regulation, the three hospitals had limited ability to actively learn and improve their services. Therefore, they demonstrated low levels of ACAP, and limited levels of Potential ACAP, i.e., they had NICE implementation processes but did not always engage in these processes. The hospitals varied in the extent of meaningful change they were able to achieve through functional organisational processes. The ACAP component of 'Identifying and accessing knowledge' was generally the role of the NICE administrators not the clinical professionals. Managers, administrators and clinicians all performed 'analysis and interpretation of new knowledge' and evidence, but only when it was deemed appropriate for them.

This was the level of ACAP that all three hospitals had reached. Going beyond this to transform knowledge (e.g., NICE guidance) within the organisation was rarely, if ever observed. This would require knowledge and evidence to be incorporated into the day-to-day workings of the hospital and to become organisational knowledge in its own right, rather than something that originated from elsewhere. External knowledge was not trusted or valued because of the implicit structural, cultural, hierarchical and professional contingencies at play. These factors influenced evidence-based decision-making in ways that were not explicit to the knowledge provider, receiver or decision-maker. The organisations lacked an in-depth understanding of these complexities, which restricted their ability to act and achieve progression towards effective knowledge mobilisation.

There were also differences in organisational cultures at the hospitals. Culture influenced practice and how staff privileged knowledge and evidence. This has been reported previously (Deal and Kennedy, 2008; Davies et al, 2000b). Hospitals differed in the extent to which staff believed they were able change and manage their culture in order to align to an organisational strategy focused around EBM. Some were resigned to the view that change was impossible, which made it difficult to establish norms which privilege clinical evidence. The professional hierarchy restricted knowledge used for organisational decisions. Knowledge possessed by surgical professionals allowed them to develop a level of prestige, discretion and autonomy over decisions that were made (Carr-Saunders and Wilson, 1933). Organisational decisions only proceeded so far before the professional gatekeepers limited what could be achieved. This restricted the impact that knowledge acquired 'outside of orthopaedics' could have, as greater weight was given to knowledge originating from 'inside'.

## **8.8 Knowledge mobilisation applied to EBM**

This section will discuss the contribution of my study in evidence-based decision-making to the existing knowledge mobilisation literature.

There is a well-established literature regarding the importance of implementing clinical evidence into practice (Sackett et al, 1996; Davidoff et al, 1995; Schunemann and Bone, 2003; Dopson et al 2003), and research has established the significance of context in enabling effective evidence-based decision-making (Dopson and Fitzgerald, 2005; Gabbey and Le May, 2004; 2011, Sausman et al, 2016). However, variation in practice still remains (Grove et al, 2016). My research indicated that this is due to a wider definition of 'evidence' which exists in clinical practice. This includes EBM, but also management and organisational knowledge amongst others. Literature regarding how these other sources of evidence and knowledge are implemented in practice is less well-established (Walshe and Rundall, 2001; Gkeredakis et al, 2011; Crilly et al, 2013).

I have explained the wider 'evidence-based' decision-making found in my study using a knowledge mobilisation perspective. I provided an understanding of how individual, groups and organisational knowledge interacts when situated within the regulatory and political environment of healthcare. Previously, knowledge mobilisation has been investigated in healthcare and other professionalised organisations, but has tended to be explained as a consequence of distinct levels of influence operating in isolation.

Systematic reviews have explored the cross-overs and gaps between the traditionally separate literatures. Early reviews (Mitton et al, 2007; Nicolini et al, 2008) focused the mobilisation of research evidence between producers and users. They identified barriers and enablers to knowledge mobilisation, linked to the individual and organisational levels such as experience, relationships and modes of communication (Mitton et al, 2007). Nicolini and colleagues (2008) described barriers and enablers which included conflict, leadership, interdisciplinary memberships and relationships, shared values and structures. These findings were largely replicated in my study throughout the individual, groups and organisational levels.

Later Contandriopoulos and colleagues (2010) explored knowledge mobilisation at organisational and policymaking levels. They reported three key issues linked



to politics, economics and social structures, therefore providing a higher level of abstraction. They called for a detailed analysis of the context in which knowledge mobilisation occurs in order to design interventions which aim to maximise knowledge use (Contandriopoulos et al, 2010). My study has sought to provide this context-dependent evidence. Oborn and colleagues (2013b) provided a narrative review of knowledge mobilisation literature along three frames (linear transfer, social process and contextual issues) to incorporate theory from management into healthcare. I have extended this to demonstrate why much of the EBM literature endorsing one particular technique or process (e.g., clinical guidance) is not fit for purpose, because context dictates what knowledge mobilisation could take place.

Recently, Ferlie and colleagues (2012) took a critical stance to examine health and management literature and classified four key domains focused on group and organisational issues. These were different types of knowledge, theoretical discourse, the disciplinary field and the organisational form. They highlighted barriers, CoP and organisational learning, culture and communication as important for knowledge mobilisation (Ferlie et al, 2012). My research adds to this complex understanding by recognising alternative sources of evidence used in clinical decisions which encompass the organisational and social science perspectives. Acknowledging that more than one type of knowledge or evidence could be selected amongst a wide range of options helps in understanding why some knowledge is mobilised more easily than others.

Davies and colleagues (2015) reviewed the macro perspective regarding how knowledge is mobilised from research and policy institutions. This aligns to my regulatory environment but does not cover the specific influence of medical regulation on knowledge mobilisation in healthcare. Davies and colleagues (2015) identified six domains: the purpose and goals, knowledge, connections and configurations between people and organisations, people, roles and positions, actions and resources available, and the context of operation. The key finding was the interaction between the domains which produced a dynamic picture of knowledge creation, communication, and action.

This body of literature describes a multitude of factors which are important for evidence-based practice (Dopson and Fitzgerald, 2005), and research into the knowledge mobilisation process has extended this (Oborn et al, 2013b). However, it has tended to do so in isolation (e.g., Gabbay and LeMay, 2004; 2011), with a focus on the explicit components of knowledge (Ward et al, 2012) or by selecting certain segments of the knowledge domain to examine whilst excluding others (Contandriopoulos et al, 2010, Oborn et al, 2013b). The literature makes reference to the importance of the context in which EBM takes place (Dopson and Fitzgerald, 2005; Gabbay and Le May, 2004). However, the definitions and descriptions of context are not explicit. My study provides an investigation of the constraints and contingencies of context which were crucial in understanding how and why knowledge mobilisation did or did not occur. I have shown how knowledge mobilisation can be enabled or constrained depending on the nature and formalisations of knowledge and role of individuals as well as the functional and social interactions in organisations. It was the flexible and adaptable knowledge-dependent context in which decisions were made that resulted in variation in clinical practice decisions.

I have extended the existing EBM literature by taking a knowledge mobilisation perspective. I have explained how knowledge was mobilised for decision-making in a professionalised context as a consequence of the interaction between all four levels of analysis, i.e., across the entire knowledge domain. I have moved beyond the narrow focus of the gap between clinical research and practice to include the knowledge of the individual in their specific situation, the tacit knowledge that is held by groups of practitioners, the complex processes and structures within organisations, all situated within a constantly changing regulatory environment made up of multiple stakeholders, e.g., policy-makers, academics, clinical practitioners and industry.

## **8.9 Original contribution**

My study has generated a number of original contributions to the field of EBM and knowledge mobilisation in the professionalised context of healthcare.

Primarily, my research provides an empirical cross-sectional study of knowledge mobilisation using NICE guidelines in three NHS hospitals in England. It demonstrates the real-world practice of knowledge mobilisation for clinical decisions.

In my research, implementation of NICE clinical guidelines was used as an empirical tracer to investigate the knowledge mobilisation that occurred across the entire knowledge domain. I examined the influence of 'knowledge generators', e.g., the policy-makers, through hospital organisations, clinical and professional groups, right down to the individual surgeons working in hospitals who are expected to adopt and implement evidence in their practice.

I have explained knowledge mobilisation in a professionalised context as a consequence of the interaction between four levels of analysis: national regulation, the organisation, the group and the individual. This interaction led to contingent knowledge mobilisation which helps to explain the variation in clinical practice decisions. A key contribution of the work is the development of a more nuanced understanding of the interaction between three key dimensions of influence (surgeon characteristics, socialisation of medical professionals, organisational capacity) when situated within the regulatory and political arena. These three dimensions drove variation in the practice of decision-making for orthopaedic surgery.

This is one of the first studies that combines an understanding of knowledge mobilisation from different literatures (clinical and organisational sciences) in evidence-based decision-making for healthcare across individuals, groups, organisations and the regulatory environment. This produced a unifying framework of knowledge mobilisation in orthopaedics. The study of EBM and knowledge mobilisation in healthcare and other professionalised organisations has tended to focus on, and be explained at, four separate levels of influence operating in isolation. Existing literature appears to centre on either the impact of individuals or groups, or on organisational dynamics or the regulatory

political forces at play. My study brings these together and this goes beyond what has been explained in the existing EBM and knowledge mobilisation literature.

Finally, I have made a contribution to the knowledge of guideline implementation as it is practised in the real world of the NHS. I have documented the experience and challenges faced in planning and designing complex organisational processes to meet recommendations made by NICE. I observed the successes and failures of trying to sanction these processes within NHS hospitals. I have provided evidence that improving healthcare services and reducing unwarranted variation in practice requires more than the passive dissemination of codified guidelines. More important was how the knowledge and evidence from individuals, groups and organisations were valued and how they interacted within the wider healthcare system.

## **8.10 Strengths and limitations of the research**

I discuss the general strengths and limitations of my study and focus on the implications of the design and analysis. I demonstrate the reliability and validity of my findings.

### **8.10.1 Broad strengths**

The strength of my research was the access I achieved. The challenges of researching elite groups, e.g., surgeons have been discussed previously (Harvey, 2001). Problems are often linked to gaining access and interview strategies. Whilst I did not encounter insurmountable access issues, the interview process was challenging at times because surgeons did not want to discuss their decisions 'on tape'. I sensed they felt their decisions were being judged, the surgeons either stating that I (as an outsider) lacked the expert knowledge to make a judgement, or that as a researcher in this field, I would tell them that they were right or wrong. To overcome this, I establish a rapport with surgeons; sometimes this was relatively easy, however, other interviews felt formal and constrained. This pattern was linked to whether they believed they were the expert knowledge holder or not. Interview location was important. Interviews in private rooms rather than on hospital wards, theatres or shared offices were

more candid.

The extended insight gained from being embedded in the hospitals over a twelve month period is a research strength. This involvement helped me to demonstrate the decisive and autonomous nature of surgeons. Over time, I learned how they maintained an inherent flexibility in their work and were averse to being questioned by others. At the end of my data collection, the surgeons were more likely to talk to me as a person rather than as a researcher who was casting judgement on their views. This was useful in helping me to develop my findings.

### **8.10.2 Design and analysis**

#### ***8.10.2.1 Design considerations***

I conducted mixed qualitative methods in my three empirical cases. I took a cross-section of surgeons and staff within each case to illuminate the complex relationships between professional hierarchies and the differences in evidence and practice. This helped to reduce the bias and confounding associated with interviewing a single professional group. A robust understanding of the factors which influenced surgeon and staff knowledge and behaviour was achieved through the use of observations and interviews, supplemented with document analysis. This enabled me to consider my findings in the context of orthopaedic surgery, and to contextualise them in terms of knowledge of evidence, theory and practice. This is consistent with the pragmatic view of Johnson and Onwuegbuzie (2004).

The cases were entirely qualitative, but the concurrent triangulation strategy approach to mixing methods outlined by Creswell (2009) provided a helpful framework to follow (Creswell, 2009). This ensured that data was collected simultaneously. Where possible, each type of data was treated equally in the analysis. However, the observations and interviews tended to carry more weight in the findings. Data collection was not fully predefined, which allowed for progressive focusing.

The limitations of my research design relate to the small sample of hospitals. At

the beginning of the research, 136 acute Trusts were functioning in the NHS and I selected three of these. However, I chose three distinct types of Trust and aimed to provide significant depth of investigation (rather than breadth) in each case. I interviewed similar numbers of professional groups at each hospital to achieve a balanced professional representation in the data. This also allowed for cross-checking between the different narratives. Nevertheless, the small numbers generate questions regarding the generalisability of my findings. It could be that my cases are limited and cannot feasibly be compared elsewhere. However, the understanding generated through my research of EBM and knowledge mobilisation has strong internal validity, therefore I believe it has wider generalisability at a higher conceptual level.

A second limitation was the exclusion of the private sector. Many of the surgeons included in my study maintained a private orthopaedic practice. This may have been a driving force in their clinical decisions that I was unable to understand in significant detail. It might influence the relationship between professional type and evidence-based decision-making. A longitudinal design which examines both sectors would enable me to explore these potential relationships further.

#### ***8.10.2.2 Analysis considerations***

I consider the data analysis techniques a strength. I transcribed a small sample of my interviews with the remainder professionally transcribed. I identified mistakes iteratively during the coding and analysis, and verified potential mistakes using digital recordings. I developed a coding frame to restrict code drift in their meaning. My coding technique was rigorous as I cross-checked my codes with field notes made at the time. I revised codes that did not fit and re-labelled and reorganised them iteratively as the analysis progressed. I checked and rechecked the codes throughout the analysis to ensure the consistency of their meaning against the coding frame.

I conducted an independent cross-check of a sample of interview codes and one interview transcript with my supervisory team. We discussed the similarities and differences, and decided if any codes were redundant. The importance of

'inter-rater reliability' in qualitative research is debated. All views are, to varying degrees, subjective and therefore present different perspectives, hence agreement and disagreement is not the focus (Pope et al, 2000; Madill et al, 2000; Joffe and Yardley, 2003). Instead it was important to understand and appreciate the diversity of views that might have added insight into my interpretation of the data.

Limitations of the case studies derive from excluding non-NHS surgeons and NHS patients. Narratives from these two groups might have added another perspective to the research, e.g., the view of the patients. Another limitation is that I did not explicitly focus on the implementation of the updated NICE guidance for hip replacement (TA 304) as intended at the beginning. As the study progressed, I purposefully decided to discuss NICE 'in general' to obtain a wider range of views, and to include those participants who had not seen or read the update. While some interviewees mentioned the guidance update, it might have benefitted my study to examine the opinions regarding the specific recommendations in the guidance.

### 8.10.3 Reliability and validity of findings

I define reliability as how accurately the findings represent the participants' realities of the social phenomena, and the extent to which they are credible to them (Schwandt, 1997). Validity refers to the inferences drawn from the data not to the raw data itself (Hammersley and Atkinson, 1983; Lincoln and Guba, 1985; Merriam, 1998). I aligned my research to the nine aspects of qualitative reliability and validity introduced by Creswell (2009). I describe how I aimed to meet each of the criteria in Table 17.

**Table 17. Creswell's (2009) nine aspects of quality, reliability and validity in relation to my research**

Criteria	Description of how the criteria was met
<i>Triangulation</i>	This is the procedure where researchers search for convergence among multiple sources of information to form themes in a study (Creswell, 2009). In my study, I aimed to triangulate data from three sources. These were interpreted together to find common themes by eliminating the overlapping areas. This process allowed me to corroborate evidence from the interviews, observations and documents. The findings have improved validity because I relied on multiple forms of evidence rather

	than a single incident or data point in the study.
<i>Disconfirming evidence</i>	I searched for disconfirming or negative evidence within my study. First, I established the preliminary categories and then searched through the data for evidence that was consistent with what I found, or which contrasted the categories and themes. This process required me to examine the multiple perspectives of a theme or category. This was an important step because it provided further support to the credibility of the findings.
<i>Researcher reflexivity</i>	In the methods section of the thesis, I disclosed my assumptions, beliefs, and potential biases that might have been important to the research. It was essential to acknowledge and describe my beliefs and biases early in the research process, to allow readers to understand my position before reading the findings.
<i>Member checking</i>	Where possible I conducted member checking. It consisted of taking both data and interpretations back to the participants in the study, so that they could confirm the credibility of the information and my narrative account. I asked each participant if they would like a copy of their transcript (raw data) and my final results. I also presented the preliminary findings of the research to a selected group of individuals in each case study so that they could comment on the accuracy of the work. They could also check that the themes made sense to them, and whether the overall account was realistic. By doing this, the participants added credibility to the research by having a chance to respond to both the data and the final results.
<i>Prolonged engagement in the field</i>	Creswell (2009) suggests that researchers can increase the validity of their study by staying in the research field for a prolonged period of time. Within the limits of time and resource of my PhD, I conducted three months of repeated observation at each site. This enabled me to build a sense of trust with participants and find the right gatekeepers to allow access to people and sites. Over time, I established rapport, so the interview participants were comfortable with the topic and were able to ask questions. The most important element of my prolonged engagement was that it allowed me time to solidify my findings. I was able to check and double-check my data and ideas, and to compare interview findings with observational data and documents. Creswell (2009) commented that the longer a researcher stays in the field, the more the pluralistic perspectives will be heard from participants, and this was absolutely the case in my study. The mixed perspectives I gained over time gave me a better understanding of the context in which the surgeons made decisions.
<i>Collaboration</i>	Collaboration implies that the participants are involved in the study as co-researchers or in less formal arrangements. Validity is gained from building the participant views into the study which then adds further credibility to the narrative accounts. This is a weakness of my study as I was not able to include participants in many of the research activities (writing objectives, interview questions, data analysis and



	interpretation). However, I was able to pilot my interview topic guide with a small group of surgeons to ensure that it made sense and was appropriate to the context I was examining.
<i>The audit trail</i>	I made a considerable effort to ensure that the audit trail of my study was strong so that credibility could be tested if required. I established protocols of the data collection process. I provided clear documentation of all research decisions and activities as they progressed. I kept research logs of all the interviews and observations that were conducted, and the documents that I collected. I selected a data analysis procedure (OSOP) so that categories and themes could be clearly understood and examined by an external person (Ziebland and McPherson, 2006). I also included an overview diagram of the data structure to show how the codes became categories and themes. The goal of establishing my audit trail was to make sure that both the processes and product of the research were sound and that my findings are trustworthy.
<i>Thick, rich description</i>	I aimed to provide detailed descriptions of the setting and the participants of my study in the methods section. I also provided thick descriptions of the four themes of the qualitative work in the results chapters. According to Creswell (2009), the purpose of a thick description is that it give the “readers the feeling that they have experienced, or could experience, the events being described in a study.” I tried to achieve this by providing as much detail as possible about each case, particularly through the use of my observation notes. Rich descriptions also help the readers of my thesis to determine the applicability of the findings to other settings, e.g., other surgical specialties, or similar contexts, i.e., other hospitals.
<i>Peer debriefing</i>	I conducted peer debriefing at each of the three hospital sites. The debriefing meetings were attended by members of the department, the hospital managers and people who had taken part in the interviews. These sessions provided an overview of the data, the research process and the preliminary findings. The meetings were useful in providing me with feedback on the study. In particular, where I could make changes to improve the work or the way it can be disseminated. The research was also presented to three academic communities for comment, therefore adding credibility to a study in terms of methods and theoretical implications.

## 8.11 Research implications for policy, practice and research

### 8.11.1 Implications for policy

Over the last 20 years, there have been significant changes in the way policy-making organisations such as NICE create and disseminate guidance to improve

health and social care. I have learnt that what has remained fairly constant is how codified knowledge in guidance is transferred in a linear fashion to clinicians working in healthcare organisations. My study has demonstrated that this approach is limited in improving evidence use and reducing variation in practice.

I have raised issues regarding whether NICE guidelines are ever appropriate for the field of orthopaedics. This is not because the evidence they contain is unusable. Instead, the way evidence was privileged by surgeons meant that guidelines were rarely accessed as a beneficial knowledge source. Surgeons were not concerned about what guidelines recommended. What was important was their definition of evidence, and how this interacted in their group and wider organisation. In my study, 'one size' guidance could never 'fit all' the levels of analysis and therefore had limited value in their specific circumstance.

Nevertheless, evidence in guidelines represents best practice and NICE must produce recommendations for healthcare. I have provided evidence to suggest that the current modes of transfer are ineffective. Changes could be made to the process of guideline creation, dissemination or even regulation. Improvements need to be made to how clinical, managerial and administrative staff working in hospitals see and think about evidence from guidelines. They could benefit from understanding that knowledge about knowledge and its use could be valuable for their organisation, e.g., it would help tailor approaches to knowledge mobilisation in specific clinical areas that are context-specific.

#### **8.11.2 Implications for practice**

Improvement interventions are needed to help users and producers of evidence identify 'where they are at', and therefore 'what types' of evidence and knowledge uptake are likely to be possible in their practice or organisation. I identified multiple sources of evidence used in real-world evidence-based decision-making processes. They held equal weight for the surgeons and were positioned in a knowledge hierarchy that was sophisticated, dynamic and changeable, depending on the contingencies of the current context. More importantly they bore little relation to traditional hierarchies of evidence. I did

not encounter any situation where NICE guidance was able to close the gap and provide a solution to a decision.

Individuals, groups and organisations expected to use NICE guidance could take a more transparent approach in understanding the evidence and how it guides guidelines. This may help them to decide whether guideline recommendations are appropriate in their context. If not, other evidence sources such as clinical experience could take precedence and be shared, explained and understood, rather than frowned upon by managers and administrators and recorded as an organisational 'risk'. Encouraging open decision-making processes might enable those on all sides of the knowledge boundary to understand and accept why certain options are taken, especially if they varied from guideline recommendations.

Practitioners could acknowledge the difference between certain types of knowledge as positive or negative to patient care. Where possible, they should focus on reducing undesirable types of evidence and knowledge present in their organisation. In my study, evidence from implant manufactures negatively impacted practice. This could be an area for improvement work. However, surgeons were often unaware or ambivalent to the consequence of their decisions because processes were not open, transparent or subject to feedback loops.

Practice-based knowledge was rarely shared between the groups in my study. Individuals from all professional groups could be encouraged to openly consider the benefits of increasing the use of this type of evidence for clinical decision-making. Awareness of what is 'happening on the ground' reflect the contingencies or constraints of practice and might help to improve decision-making processes. This would be difficult in my case study hospitals, given the different organisational cultures and divides between professional groups. The groups of surgeons working in CoP retained authority over the knowledge that was accepted and used in practice. This group level influence is an area where the biggest changes can potentially be made.

I identified key contextual dimensions that could be targeted to optimise the uptake of evidence in orthopaedic practice. Those responsible for guideline implementation should examine the contingencies of practice within their department to uncover 'who' or 'what' is driving decisions. In my study, organisational issues such as the availability of staff restricted an orthopaedic department in achieving national targets (Monitor, 2013). These factors were not directly associated with the type of knowledge that is privileged in practice, rather the organisational limits within the hospital.

Regulation was a valuable mechanism as it achieved a desired outcome for achieving targets and controlling the behaviour of the surgeons. However, moving towards regulation as the norm did not appear to be a desirable option for most of the professional groups in my study. Knowledge and evidence from regulators did not hold the same positive status that could be achieved by knowledge and evidence that originated from colleagues. Restricting the discretion and authority of clinical professionals by increasing regulatory power would not be recommended. Instead, other mechanisms, which take advantage of the positive associations for improving evidence-based practice between colleagues, would be encouraged.

### **8.11.3 Implications for research**

Research into the moderating and mediating effects of the different types of knowledge on decision-making is needed to further explore the pathways that lead to positive or negative decision-making practices. The processes of knowledge mobilisation found in my study between individuals, groups and organisations have identified that the evidence considered important to practice can and does change often. This was dependent on the context in which it was examined. Understanding context and the diverse types of knowledge will be essential in influencing behavior change in practice. It may be possible to foster an environment where positive decision-making practices become the norm. The control exerted by the CoP was an unexpected finding. In the context of orthopaedics, this provides insight into the approaches for knowledge mobilisation targeted at the CoP as an area for improvement. Research into how

CoP could promote the uptake of NICE guidance in practice would be an important area for investigation.

I found that the hierarchies of knowledge used in practice held little relation to the traditional hierarchy of evidence in EBM. Therefore, deviation from the evidence in NICE guidance could be justified and is at times appropriate. This shifting hierarchy of evidence challenges the traditional view that certain types of clinical evidence should be privileged over others. I have illustrated that this assumption was of no benefit in decision-making for surgeons working in contingent environments. It was not easy or even possible for a surgeon to disregard other knowledge in favour of clinical evidence. Research can investigate how to encourage evidence in the form of EBM to be incorporated into decisions made in the context of practice.

Finally, the integration of the levels of analysis was useful for understanding surgical decision-making. The next step is to examine learning within organisations to try to increase the capacity of hospitals to identify, integrate, transform and use knowledge across all levels of practice. Single interventions targeted at clinicians, or NICE protocols developed by administrators, were unable to achieve meaningful change in my research due to the fact that they did not span the entire knowledge domain. Knowledge did not flow evenly across the disciplinary and organisational boundaries. This leads me to question what type of knowledge mobilisation strategies would make for more successful guideline implementation programmes.

Investigating the nature of the diverse boundaries and their influence on the mobilisation process will be important for further progress in the field. This will include examination of professional power dynamics associated with knowledge, and how it is constituted and its relationship with practice. For example, I demonstrated how professionals were able to contradict and undermine explicit knowledge emerging from EBM. There is a considerable amount of research to be conducted to identify, design, implement and evaluate programmes that deliver organisational knowledge mobilisation strategies.

## **8.12 Chapter summary**

In this chapter I have discussed the research process and highlighted the broad findings of the study. I have answered my research questions and summarised the three case studies and four empirical themes. I discussed my contribution to knowledge, the strengths and limitations of the study and the implications for policy, practice and research.

The aim of my study was to assess the role of EBM in orthopaedic surgical practice decisions. To achieve this, I identified and described the sources of evidence and knowledge used in everyday surgical work and illustrated how the brokering and mobilisation of knowledge and evidence contributes to variation in practice. My in-depth and inter-disciplinary exploration has revealed how many distinct and diverse types of evidence and knowledge were mobilised in the context of clinical practice.

I have explained knowledge mobilisation in a highly-professionalised organisationally-regulated context as a consequence of the interaction between four levels of analysis: the individual, group, organisation and national regulation. This interaction led to contingent knowledge mobilisation which helps to explain the variation in clinical practice decisions. I discovered three key dimensions for 'evidence-based' decision-making which were important drivers for knowledge used in practice. These were the individual surgeon characteristics, the socialisation of medical professionals and the organisational capacity of the hospital.

I have demonstrated that the mobilisation of knowledge in surgery gives more weight to the professional networks and CoP to which surgeons belong. Codified evidence in clinical guidelines challenge the discretion and autonomy held by the individual surgeons and their groups. Therefore, knowledge gained through socialisation with colleagues and the evidence privileged via professional hierarchies governed decision-making practices. This rationalises why orthopaedic surgeons do not always use clinical evidence in decision-making.

The implications of my findings are that guidelines from policy-makers are not always appropriate for practice. The brokering of clinical evidence alongside other sources of knowledge by the surgeons meant that EBM was rarely viewed as beneficial. This could be tackled in practice through improvement interventions to help users and producers of evidence scrutinise their organisational knowledge capacity and uncover what types of knowledge uptake are likely to be possible in their organisation.

Key contextual factors need to be identified to target and optimise the uptake of evidence in different types of practice. Research could assist in this process by exploring the moderating and mediating effects of knowledge on decision-making to understand what creates effective practices. Evidence use and uptake in CoP could be an insightful area of further investigation. This will build on the important findings of my study which revealed the complexity of knowledge mobilisation in a highly professionalised organisationally regulated context.

## 9 Conclusion

### 9.1 Introduction

This chapter demonstrates how the research questions have been answered and defines the contribution to knowledge of this work.

The aim of my study was to assess the role of EBM in orthopaedic surgical practice decisions. I examined three orthopaedic departments located in NHS hospitals. Case study data was analysed and four themes were presented which reflect the four levels at which knowledge was enacted in practice. The findings revealed distinct sources evidence and knowledge used in surgical practice decisions. Variation from clinical guidelines was played out according to how each surgeon brokered and mobilised evidence and knowledge to deal with the contingencies and constraints that were inherent in orthopaedic work.

I have demonstrated that the uptake of clinical evidence was not achieved, and instead guidelines challenged the autonomy and discretion of clinicians. The pragmatic mechanisms by which knowledge is mobilised in surgery gives more weight to the professional networks and CoP to which the surgeons belonged. This understanding helps to explain why orthopaedic surgeons do not always use evidence in their decision-making.

### 9.2 Answers to the three research questions

*RQ1 What types of evidence and knowledge are considered important by orthopaedic surgeons when making clinical practice decisions?*

During the three case studies a wide array of types of evidence and knowledge were identified which influenced clinical decisions. These included formal codified knowledge, managerial and organisational knowledge, socialised knowledge of colleagues, cultural and political norms, training and education, experiential knowledge and knowledge from implant manufacturing companies amongst other. The different types of evidence and knowledge were mutually



exclusive and the process of privileging one over another in a contextual hierarchy of evidence was flexible and adaptable.

*RQ2. How are evidence and knowledge mobilised in the real-world practice of orthopaedic surgery in the NHS?*

Case studies revealed that all surgeons performed 'evidence'-based decision-making in their work. However, clinical evidence was only one form of evidence important in this context. Multiple levels of practice interacted and impacted on how knowledge was identified, adopted, integrated and mobilised in surgical work. These were the individual, group and organisational influences, which functioned within the contingencies of practice and the overarching regulation of healthcare. Variation in practice was a consequence of how evidence was defined and privileged by surgeons, non-clinical professionals and the entire hospital.

*RQ3. What are the key dimensions of knowledge mobilisation which influence variation in decision-making in the orthopaedic surgery NHS environment?*

Three key dimensions influenced variation across all the levels in the practice of decision-making. These were the individual surgeon characteristics (gold-standards, mavericks and innovators), the socialisation of medical professionals and the organisational capacity of the hospital. They represent potential areas for improvement in the way evidence is presented and disseminated across the three cases. 'Evidence' in real-world practice is multifaceted and contextually contingent. Therefore, traditional linear codified approaches to dissemination are not appropriate.

### **9.3 Contribution of my research**

My research provides an empirical study of knowledge mobilisation using NICE guidelines collected cross-sectionally in three NHS hospitals in England. I explored EBM from a knowledge mobilisation perspective to provide a unifying framework of the process of knowledge mobilisation into clinical-decisions.

I have extended the existing EBM literature by taking a knowledge mobilisation perspective (Dopson et al, 2003; Dopson and Fitzgerald, 2005; Mitton et al, 2007; Nicolini et al, 2008; Contandriopoulos, et al 2010; Ferlie et al, 2012; Davies et al, 2015, Oborn et al, 2013b). I explained how knowledge is mobilised for decision-making in a professionalised context as a consequence of the interaction between four levels of analysis across the entire knowledge domain. I have moved beyond the narrow focus of the gap between clinical research and practice (Sackett et al, 1996; Davidoff et al, 1995; Schunemann and Bone, 2003) to include the knowledge of the individual in context, the tacit knowledge held by groups, the complex processes and structures within organisations, all situated within a constantly changing regulatory environment made up of multiple stakeholders, policy-makers, academics, clinical practitioners, and industry.

I have illustrated the contingencies and constraints of healthcare context that are crucial for understanding how and why knowledge mobilisation occurs or not. It was the flexible and adaptable knowledge-dependent context in which decisions were made that resulted in variation in clinical practice decisions. The interaction between the individuals, groups, organisations and the regulatory environment led to contingent knowledge mobilisation and differences in the processes of decision-making. I provide a more nuanced understanding of the interplay and interaction between individual surgeon characteristics, the socialisation of medical professionals and the organisational capacity of hospitals. I described the process of knowledge mobilisation in clinical decisions when situated within the regulatory and political arena.

I have contributed to the knowledge of guideline implementation as it is practised in the real world of the NHS. I provided evidence that improving healthcare services and reducing unwarranted variation in practice requires more than the passive dissemination of codified guidelines. I have demonstrated that knowledge from individuals, groups and organisations is valued differently and this has implications across all levels of knowledge mobilisation.

## 9.4 Summary

I investigated the implementation of NICE clinical guidelines in orthopaedic decision-making. This empirical tracer illustrated how knowledge mobilisation occurs throughout all levels of the knowledge domain and in the interaction between individuals, groups, organisations and the regulatory environment. Previously, the study of knowledge mobilisation and EBM has focussed on, and been explained as a consequence of, four separate levels of influence (individual, group, organisation and regulatory environment) operating in isolation. My research extends this by presenting the entire complexity of knowledge mobilisation in this highly professionalised organisationally-regulated context.

My in-depth and inter-disciplinary exploration has revealed how distinct and diverse types of knowledge were continually mobilised in practice. In surgery, more weight is given to professional networks and the CoP to which orthopaedic surgeons belong. Surgeons vary considerably in the extent to which they use clinical evidence in decision-making. EBM was rarely viewed as beneficial and guidelines from policy-makers were not always appropriate for practice.

Evidence-based clinical guidelines remain essential to ensure healthcare services deliver the most clinical and cost-effective interventions and procedures to patients. The future success of clinical guidelines requires users of evidence to scrutinise their organisational capacity to uncover what types of knowledge uptake are likely to be possible in their organisation. We need to identify the key contextual factors that should be targeted and optimised to improve uptake of evidence in different types of practice. The mobilisation of evidence and knowledge in Communities of Practice will be an exciting starting point for further investigation.

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## 11 Appendices

No.	Section in the document	Content
1	6.3.3.1 Case study research	<b>Published study protocol</b> Copy of: <i>Grove, A., Currie, G., and Clarke, A., 2015. The barriers and facilitators to the implementation of clinical guidance in elective orthopaedic surgery: a qualitative study protocol. Implementation Science. 10(1)81 DOI 10.1186/s13012-015-0273-6</i>
2	Box 2. Study regulatory context: ODEP rating and Best Practice Tariff (BPT) rating	<b>Orthopaedic Device Evaluation Panel (ODEP) Explanation</b> A general explanation of the ODEP ratings used to rate hip implants
3	6.3.4.1 Ethics	<b>Copies of ethical approval</b> Ethical approval was granted by the University of Warwick Biomedical Research Ethics Committee on the [reference no: REGO-2014-645] and via the R&D department of each of my three hospital sites
4	6.3.4.3.1 Interviews	<b>Participant information sheet</b> Each potential participant was given this participant information sheet which detailed the nature of the study and what would be expected of them
5	6.3.4.3.1 Interviews	<b>Interview topic guide</b>

		<p>This guide was used during interviews. It is divided into two parts, 1) structured questions aimed at obtaining general information 2) unstructured questions about experiences, beliefs and attitudes towards evidence and clinical practice</p>
6	10.2.2.4 CQC at the hospitals	<p><b>CQC reports from three hospital sites</b></p> <p>Ratings from the CQC reports of hospital sites A, B and C at the time the study was conducted</p>
7	As referenced on page v	<p><b>Supplementary articles associated to the thesis</b></p> <p><i>Grove, A., Johnson, R., Clarke, A., and Currie, G., 2016. Evidence and the Drivers of Variation in Orthopaedic Surgical Work: A Mixed Methods Systematic Review. Health Syst Policy Res. 3(1).</i></p> <p><i>Johnson, R., Grove, A., Clarke, A., 2017. Pillar Integration Process: A technique to integrate data in mixed methods research. Journal of Mixed Methods Research. In Press.</i></p>

## **Appendix 1. Published study protocol**

Please see separate article

*Grove, A., Currie, G., and Clarke, A., 2015. The barriers and facilitators to the implementation of clinical guidance in elective orthopaedic surgery: a qualitative study protocol. Implementation Science. 10(1)81 DOI 10.1186/s13012-015-0273-6.*

## **Appendix 2. Orthopaedic Device Evaluation Panel Explanation**

ODEP is an organisation established in 2002 to monitor the evidence (presented to it by the implant manufacturer) for different types of hip implants (hip femoral stems and hip acetabular cups rated separately). They assess implants against benchmarks set by NICE for implant survivorship. Initially, the NICE benchmark was of a replacement rate of less than 1 in 10 (10%) at 10 years.

An ODEP Rating consisted of a NUMBER and a LETTER.

The number represents the number of years for which the product's performance has been evidenced: 10: ten years of evidence - full compliance with NICE benchmark. 7 (or 5 or 3): seven (or five or three) years of evidence - product is on-track to achieve the 10 year benchmark, but has not yet got sufficient data to evidence performance at 10 years. Implants are expected to progress through 3, 5, 7 and 10 year ratings as data become available; failure to follow this progression within a defined timescale will result in removal of a product's ODEP rating.

The letter represents the strength of evidence (data) presented by the manufacturer:

A: strong evidence - generally higher numbers of patients (giving greater confidence in the results presented), with all patients being subject to follow-up (their outcomes recorded).

B: acceptable evidence - smaller numbers of patients than the A rating (giving less confidence in the results than A), but sufficient data to demonstrate compliance.

Following revised guidelines from NICE in February 2014, the benchmark replacement rate of less than 1 in 20 (5%) at 10 years was defined, and a STAR was added to the ODEP Rating system.

The star is awarded where products are evidenced to comply with this benchmark. A\* represents very strong evidence above A and B. Ratings without a star signify compliance to the prior NICE guidance of a replacement rate of less than 1 in 10 (10%) at 10 years (ODEP, 2017).

### Appendix 3. Ethical approval

University of Warwick Biomedical Research Ethics Committee

2<sup>nd</sup> June 2014

**Warwick**  
Medical School

PRIVATE

A-104  
Warwick Medical School  
University of Warwick  
Gibbet Hill Road  
Coventry  
CV3 2QS

Dear Amy

Study Title and BSREC Reference: *Barriers and facilitators to implementation of NICE clinical guidance in UK practice: elective orthopaedic surgery for the treatment of end stage arthritis with total hip replacement* **REGO-2014-645**

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Thank you for submitting your revisions to the above-named project to the University of Warwick's Biomedical and Scientific Research Ethics Sub-Committee for approval.

I am pleased to confirm that approval is granted and your study may commence.

Please keep a copy of the signed version of this letter with your study documentation.

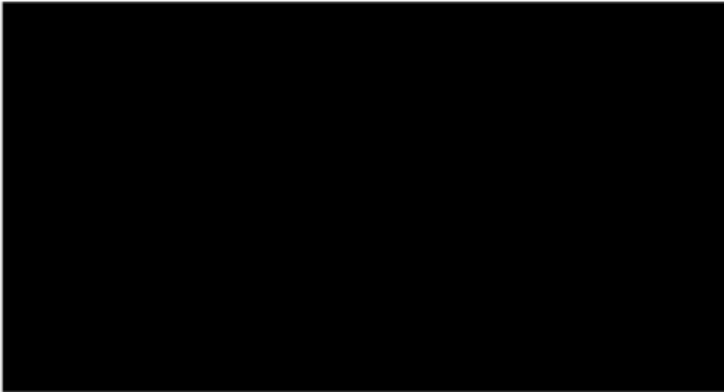
Yours sincerely


PP 

David Davies  
Chair  
Biomedical and Scientific  
Research Ethics Sub-Committee

**Biomedical and Scientific  
Research Ethics Sub-Committee**  
A010 Medical School Building  
Warwick Medical School,  
Coventry, CV4 7AL.  
Tel: 02476-151875  
Email: [BSREC@Warwick.ac.uk](mailto:BSREC@Warwick.ac.uk)

## Case study A:





Date: 30 July 2014

Ms Amy Grove,  
NIHR Doctoral Research Fellow,  
The University of Warwick,  
Warwick Medical School,  
University of Warwick,  
Coventry,  
CV4 7AL

Dear Amy,

**Letter of access for research**

This letter confirms your right of access to conduct research through University [redacted] for the purpose and on the terms and conditions set out below. This right of access commences on **31 July 2014** and ends on **30<sup>th</sup> July 2017** unless terminated earlier in accordance with the clauses below.

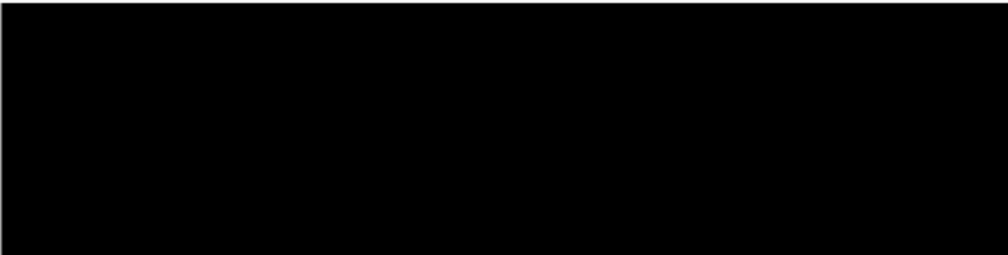
You have a right of access to conduct such research as confirmed in writing in the letter of permission for research from this NHS organisation. Please note that you cannot start the research until the Principal Investigator for the research project has received a letter from us giving permission to conduct the project.

[redacted]

research contract with this NHS organisation. We are satisfied that such pre-engagement checks as we consider necessary have been carried out.

[redacted]

access to other benefits provided by this NHS organisation to employees and this letter does not give rise to any other relationship between you and this NHS organisation, in particular that of an employee.



## Case study B:

Thursday, 9 February 2017 12:05:17 Greenwich Mean Time

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**Subject:** RE: [REDACTED]  
**Date:** Tuesday, 7 October 2014 10:36:09 British Summer Time  
**From:** [REDACTED]@nhs.uk  
**To:** Grove, Amy

Hi Amy

It's all ready, I am just awaiting a signature on your Letter of Access before I can post it out to you.

Kind regards,

[REDACTED]

Research Management & Governance Facilitator

[REDACTED]

DISCLAIMER: This email file and any files transmitted with it are confidential and intended solely for the use of the individual or entity to whom they are addressed. Any views or opinions expressed are those of the author and do not represent the views of [REDACTED] Hospitals NHS Foundation Trust unless otherwise explicitly stated. The information contained in this email may be subject to public disclosure under the Freedom of Information Act 2000. Unless the information is legally exempt from disclosure, the confidentiality of this email and your reply cannot be guaranteed. If you have received this message in error, please notify me and remove it from your system.

**Save Paper - Do you really need to print this e-mail?**



## Case study C:

[Redacted]

Our R&D ref: 14/062 [Redacted]

Wednesday, 20<sup>th</sup> August 2014

Dr Amy Grove  
NIHR Doctoral Fellow  
A-104  
Warwick Medical School  
The University of Warwick  
Gibbet Hill Road  
Coventry  
CV3 2QS

Dear Dr Grove,

**Study title:** Barriers and facilitators to implementation of NICE clinical guidance in UK practice: elective orthopaedic surgery for the treatment of end stage arthritis with total hip replacement.

**REC reference:** N/A

Thank you for forwarding information on the above study. I can confirm approval for the study to proceed within [Redacted]

Your project will now be added to the [Redacted] Research Register which will identify the following:

- Chief Investigator: As above
- Sponsoring Organisation: University of Warwick
- Host Organisation: [Redacted]
- Type of Study: Qualitative Research Project

[Redacted]

## **Appendix 4. Participant information sheet**



Division of Health Sciences

University of Warwick

Coventry, CV4 7AL

**Contact name:** Amy Grove

**Telephone:** 02476 151584

**Mobile:** 07779612101

**Email:** A.L.Grove@warwick.ac.uk

### **Participant Information Sheet**

**Title of Study: Implementation of NICE clinical guidance in UK practice: elective orthopaedic surgery for the treatment of end stage arthritis with total hip replacement.**

The purpose of this sheet is to ensure that you understand the information about the study and are able to make an informed choice as to whether you should take part or not.

#### **A brief study outline of the study is included for your information**

This qualitative research project will aim to investigate the use of evidence based practice in NHS orthopaedic surgery. In particular it will explore decision-making for hip replacement by orthopaedic surgeons and associated surgical staff and managers.

The research uses three types of data collection, observation, interview and analysis of key documentation. This particular request for is for participation in the interviews. We hope that the findings will inform the design of an intervention aimed at improving the design, dissemination, uptake and understanding of evidence based guidance for orthopaedic practice in the NHS.

**What do I have to do to take part?**

You will take part in an interview with Amy Grove, the lead investigator for this research. The interview will be carried out to access your experience, attitudes and views of evidence based practice and decision making in orthopaedic surgery.

**Are my personal details at risk by taking part?**

No. I will allocate you a unique code to complete the interview and none of your personal details are requested, this effectively makes your responses anonymous. All information collected during the course of the research will be strictly confidential. Any information which leaves the hospital will have your details removed so that you cannot be recognised from it.

**Why have I been chosen to take part in the project?**

You have been chosen because you work in or are involved with the practice of the orthopedics department in your hospital. I am interested in studying and comparing the views and experiences of staff in relation to decisions, evidence, policy and practice within the NHS.

**Do I have to take part in the project?**

No. It is up to you whether or not to take part. You also have the right to withdraw from the research process at any time. You will be able to withdraw your data up until the point at which data synthesis begins. Then data withdrawal will no longer be possible. You can request withdrawal by contacting the lead researcher (Amy Grove) if you wish to withdraw after the interview focus. If you wish to withdraw beforehand you can inform Amy Grove at any time prior to the scheduled date.

**What are the possible disadvantages and risks of taking part?**

There are no specific disadvantages to taking part in the project.

**What are the possible benefits to you of taking part?**

There are no specific benefits in taking part. However, the information I get from this project will help to inform the production and dissemination of evidence in the future.

**What happens if I want to complain or have concerns about this research?**

If you wish to complain, or have any concerns about any aspect of the way you have been approached or treated during the course of this project, you may contact

Jo Horsburgh

Deputy Registrar

Deputy Registrar's Office

University of Warwick

Coventry

CV4 8UW

Email: [J.Horsburgh@warwick.ac.uk](mailto:J.Horsburgh@warwick.ac.uk)

**PA** – Natasha Lynch

Tel: 024 765 22706

Email: [n.lynch@warwick.ac.uk](mailto:n.lynch@warwick.ac.uk)

**What will happen to the results of the project?**

At the end of the project I will publish the findings in medical journals and at medical conferences. You will not be identified in any reports or publications resulting from the study. If you would like to obtain a copy of the published results, please contact Amy Grove (02476-151584).

**Who has reviewed this project?**

This project has been reviewed by National Institute for Healthcare Research: Doctoral Research Fellowship Programme and Warwick University Biomedical & Scientific Research, ethics Committee.

**What should I do now?**

If you agree to take part in the project then please proceed to completing the consent form. If you do not wish to take part you do not need to do anything more.

## **Appendix 5. Interview topic guide**

This is an emergent process using an abductive research strategy that allows theory to emerge from data collected and previous research at each progressive phase. I will use progressive focusing to develop themes and questions as the interviews advance.

However, for the processes of ethical review, some of the topics that I anticipate discussing during interview will include:

1. Questions to understand surgeons' and staff approach to clinical evidence
2. What strategies are used by professionals when making clinical decisions
3. Questions to explore the implementation of clinical guidance from the individual's perspective
4. What they consider the extent of their involvement and impact upon surgical practice
5. Questions to gather professional narratives to understand the influence of pre-existing regulatory practice
6. Exploration of the importance, implementation and integration of clinical guidance in practice.










## Appendix 6. CQC reports from three hospital sites

Displayed below are the CQC ratings from the CQC reports of hospital sites A, B (B1 and B2) and C at the time the study was conducted. The questions are different at site A due to the report being conducted earlier than site B and C.









Site A:

Ratings		
Overall rating for this trust		Requires improvement 
Are services at this trust safe?	Requires improvement	
Are services at this trust effective?	Good	
Are services at this trust caring?	Good	
Are services at this trust responsive?	Requires improvement	
Are services at this trust well-led?	Requires improvement	









Site B1:

Overall rating for this hospital		Requires improvement 
Urgent and emergency services	Requires improvement	
Medical care	Requires improvement	
Surgery	Good	
Critical care	Outstanding	
Maternity and gynaecology	Good	
Services for children and young people	Good	
End of life care	Requires improvement	
Outpatients and diagnostic imaging	Requires improvement	

Site B2:

Ratings		
Overall rating for this hospital		Requires improvement 
Urgent and emergency services	Requires improvement	
Medical care	Requires improvement	
Surgery	Good	
Critical care	Outstanding	
Maternity and gynaecology	Good	
End of life care	Requires improvement	
Outpatients and diagnostic imaging	Requires improvement	

Site C:

Ratings		
Overall rating for this hospital		Good 
Urgent and emergency services	Good	
Medical care (including older people's care)	Good	
Surgery	Good	
Critical care	Outstanding	
Maternity and gynaecology	Outstanding	
Services for children and young people	Good	
End of life care	Requires improvement	
Outpatients and diagnostic imaging	Outstanding	