IMPROVING QUALITY OF CARE IN RENAL REPLACEMENT THERAPY USING A 
COLLABORATIVE APPROACH

A thesis submitted to The University of Manchester for the degree of 
Master of Philosophy Business and Management 
In the Faculty of Humanities

2012

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Abstract

Improving Quality of Care in Renal Replacement Therapy Using a Collaborative Approach
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October 2012

Introduction:
In the past few decades, there have been rapid advances in knowledge of best practice in all areas within healthcare. Despite this, a large gap remains between what is best practice and the care that actually received by patients.

Quality improvement collaborative is a way that has increasingly been used in healthcare to bridge the quality gap. Despite its increasing use and popularity, studies on effectiveness of quality improvement collaborative have shown conflicting results and it is still difficult to predict which collaborative can be successful.

Purpose:
The aim of this study is to improve understanding of the quality improvement collaborative by analysing how this approach is used by an organisation to implement changes and improve service delivered to patients. In particular, this study focused on frontline staffs view on quality improvement collaborative.

Design:
An evaluation of a quality improvement collaborative in an area of renal replacement therapy was conducted. The evaluation involved semi-structured interview on fifteen frontline staffs from five improvement teams working in an improvement collaborative. Data from existing and secondary sources were used to help with the evaluation. Thematic analysis was used to analyse the data obtained.

Findings and Conclusion:
The key findings in this study can be summarised into eight recurring themes: 1. certain elements of the collaborative were perceived to be helpful to frontline staff performing a quality improvement work; 2. inappropriate application of collaborative elements can impede improvement work; 3. applications of collaborative elements need to be tailored to accommodate different characteristic of participants and improvement teams; 4. improvement teams determine the success of a collaborative; 5. improvement teams need to be organised to ensure a successful collaborative; 6. support from senior leadership and management is crucial; 7. there are many barriers to a quality improvement collaborative and 8. frontline staff identifies contextual factors that can influence a collaborative

Research recommendation:
The literature suggests that more focus should be given to evaluate the process around the improvement collaborative to help to better understand ways to improve the success of a collaborative work. Frontline staffs participating in this research have provided some differing views on the collaborative elements, success and barriers to quality improvement collaborative. Further bigger research on multiple organisations can be beneficial to see whether similar trend can be found to improve generalisability and to assess the reproducibility of this study.

Recommendation for future collaborative:
Future collaborative can use the findings in this study to help plan their collaborative work by improving application of elements, utilising determinants of success and avoiding barriers to improvement that were identified in this study.
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List of Abbreviations
AHRQ: Agency for Healthcare Research and Quality
BTS: Breakthrough Series
IHI: Institute for Healthcare Improvement
IOM: Institute of Medicine
QI: Quality Improvement
Chapter 1: Introduction

1.1 The Quality Chasm

Rapid advances in science have led to the significant development of many areas in healthcare over the past century. We now have the ability to treat communicable infectious diseases such as tuberculosis and malaria and are also able to reduce death due to modern diseases such as heart disease, hypertension and diabetes by using tablets and transplantation of vital organs.

Despite these advances, the healthcare system often fails to deliver good, evidence-based quality care. Instead of providing quality care resulting in the desired outcome, the health care system provides care that results in lives lost, harm to individuals and a waste of resources.

A report by the Chief Medical Officer for England suggests that each year poor quality care resulted in significant harm: for example, 400 people died or were seriously injured in adverse events involving medical devices and nearly 10,000 people are reported to have experienced serious adverse reactions to drugs (Department of Health, 2000). A report by the Health Commons Select Committee revealed that 10% of patients admitted to hospital suffer from some form of harm, most of it avoidable, resulting in an estimated extra cost of £1 billion (Health Select Committee, 2009).

In a landmark report in 2001, the Institute of Medicine proposed that this phenomenon occurred because of what is now termed the ‘quality chasm’ – the gap that exists between what can be provided by scientific knowledge and the ability of the healthcare system to translate it into practice (Committee on Quality of Health Care in America, 2001). The report states that the safety, effectiveness, patient centeredness and timeliness of care have to be improved, while keeping costs from rising further. Efforts have been made in different avenues to bridge the ‘quality chasm’, for example by creating care programmes (Berg, Schellekens and Bergen, 2005), improving continuing medical education (Barnes, 2004) and using an information technology infrastructure (Weir, et al., 2006). In recent years, formal quality improvement initiatives have gained popularity in many countries to help bridge the ‘quality chasm’. The establishment of the Institute for Healthcare Improvement, its rapid increase in repute and widespread adoption of their quality improvement method is an example of this trend.
1.2 Quality Improvement in Healthcare

Debate still persists on how best to define the term ‘quality improvement’ in healthcare. Two examples of definition of quality improvement in healthcare are:

1. The ‘combined and unceasing efforts of everyone to make the changes that will lead to better patient outcomes, better system performance and better professional development’ (Batalden and Davidoff, 2007)
2. ‘Systematic, data-guided activities designed to bring about immediate, positive changes in the delivery of health care’ (Kaplan, et al., 2010).

Quality improvement was first formally established in the manufacturing industry back in the 1930s by Walter Shewhart and propelled further by the works of William Edwards Deming, Joseph Juran, Kaoru Ishikawa and others (Boaden, et al., 2009).

The development of quality as a concept in healthcare is not something new. The medical profession, with their nature of apprenticeship and approach to work, has been the predominant force to continuously developing quality in healthcare (Boaden, et al., 2009). However, the application of formal quality improvement to the healthcare field is relatively new phenomena. This has been partly due to combination of an evolutionary process influenced by rapid improvement in scientific knowledge and as a response to well-publicised healthcare failures.

The evolution of quality improvement in healthcare has occurred in stages, from the passive diffusion of information via publications of research and trials, widespread movement of guidelines and systematic review to the application of industrial-style methods (Shojania and Grimshaw, 2005).

<table>
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<th>Box 1. Evolution of quality improvement in healthcare (Summarised from Shojania and Grimshaw, 2005)</th>
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<tr>
<td>• Passive diffusion (“If you publish it, they will come”)</td>
</tr>
<tr>
<td>• Guidelines and systematic reviews (“If you read it for them, they will come”)</td>
</tr>
<tr>
<td>• Industrial-style quality improvement (“If you TQM/CQI it, they will come”)</td>
</tr>
<tr>
<td>• Systems re-engineering (“If you completely rebuild it, they will come”).</td>
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Since the 1980s there has been wide acceptance of applying different methodologies in healthcare quality improvement. In the beginning, Continuous Quality Improvement (CQI) or Total Quality Management (TQM) techniques were introduced into health care, in which the strategies emphasise that most quality problems are a result of “system” failings rather than problems with individual practitioners.

The Institute for Healthcare Improvement was founded in 1991 and has been instrumental in the evolution of quality improvement in healthcare. The institute promoted the use of rapid cycle testing using a Plan-Do-Study-Act cycle in healthcare and, more importantly, introduced a version of a quality improvement collaborative called the Breakthrough Series.

1.2.1 The Quality Improvement Collaborative

Quality improvement collaboratives have been used in many clinical areas in many differing organisational contexts. The quality improvement methodology has been adopted by significant number healthcare systems in many countries.

There are different types of quality improvement collaborative apart from the model introduced by the Institute of Health Improvement. Generally, a collaborative brings together groups of multidisciplinary practitioners from different healthcare organisations to work in a structured way to improve one aspect of the quality of their service. Participants are provided with both information on the latest evidence and best practice relating to subject matter and also on the improvement of knowledge consisting of quality improvement theory, quality improvement tools and change management skills. In a review of collaborative research, Øvretveit and colleagues (Øvretveit, et al., 2002) concluded that a quality improvement collaborative contains many, if not all, of these features, as listed below.
As previously mentioned, there are various types of quality improvement collaborative, each applying slightly different methods. For example, each Vermont Oxford Collaborative project usually lasts 2-3 years using a continuous quality improvement technique, tackling multiple topics specifically associated with neonatal care at the same time (Horbar, et al., 2001), whereas the Institute for Healthcare Improvement’s Breakthrough Series method is shorter and only concentrates on one single topic each time (Institute of Health, 2003). Table 1 below lists three examples of improvement work that have applied collaborative methods.

Box 2. Features of a collaborative (adopted from Øvretveit, et al., 2002)

- Multi-professional teams within a subject area working together and sharing improvement strategy
- A focused clinical or administrative subject: for example, reducing Caesarean sections or wait times and delays or improving asthma care
- Improvement work within an area that has large variations in care or gaps between best evidence-based and current practice
- Participants learn from experts about the evidence for improvement, about change concepts and practical changes which have worked at other sites, and about quality improvement methods.
- Participants use a change testing method to plan, implement and evaluate many small changes in quick succession
- Teams set measurable targets and collect data to track their performance
- Participants meet at least twice, usually more, for 1–3 days to learn the methods, report their changes and results, share experiences and consider how to spread their innovations to other services.
- Between meetings participants continue to exchange ideas and collaborative organisers provide extra support, sometimes through visiting facilitators.
Table 1. **Examples of Types of Collaborative in Healthcare (Hulscher, Schouten and Grol 2009)**

<table>
<thead>
<tr>
<th>Collaborative</th>
<th>Area worked on</th>
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<tr>
<td>Northern New England Cardiovascular Disease Study Group (1986)</td>
<td>Regional effort in improving cardiac intervention care</td>
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### 1.2.2 The Institute for Health Improvement’s Breakthrough Series

In 1995, the Institute for Healthcare Improvement introduced the concept of the “Breakthrough Series”, which brings together health care organisations working within a specific methodology. The IHI defines a collaborative as ‘a short-term, 6-15 months learning system that brings together a large number of teams from hospitals or clinics to seek improvement in a focused topic area’ (Institute of Health, 2003). Typically, each Breakthrough Series collaborative is composed of a number of participating health care organisations and guided by a faculty with expertise in the clinical area and quality improvement methods. Figure 1 below summarises the methodology.

Figure 1 – **Institute for Healthcare Improvement’s Breakthrough Series**
1. **Topic selection:** The project organiser will determine a particular issue in health care where improvement is required and is possible to achieve.

2. **Faculty recruitment:** The project organiser identifies internal and external experts in the topic selected. The experts consist of a subject matter expert, implementation expert and/or patient experience expert. The expert faculty will outline the framework for the collaborative teams to work with using the best available evidence on the chosen topic.

3. **Enrolment of participating organisations and teams:** organisations can apply or be invited to join the collaborative. Enrolment in a collaborative varies in different countries: in certain countries, organisations participating in an Institute for Healthcare Improvement collaborative will be required to contribute to the enrolment costs. The organisation that joins a collaborative will be required to appoint a senior sponsor and multidisciplinary team to work on the topic in the organisation.

4. **Learning sessions:** the multidisciplinary teams from participating organisations will typically attend three face-to-face meetings throughout the collaboration. The meetings aim to go through the collaborative framework, teach quality improvement and measurement skills. The participants can share their success, barriers and how they implement change during these learning sessions.

5. **Action periods:** in between the learning sessions the teams will test and implement changes. They will also participate in regular conference calls, emails and other collaborative-organised events.

6. **The Model for Improvement:** the teams will be taught how to use the Model for Improvement to test and implement changes. The model has four requirements: the first three involve the team answering probing questions regarding aim, measurement and change, followed by a trial of change in a cycle (PDSA cycle).
7. Summative congresses and publications: the team presents their work to other individuals outside the project.

8. Measurement and evaluation: the participating teams will continue to feedback data and assessment over time.

To date, the Institute for Healthcare Improvement has conducted collaboratives with more than 2000 teams working on 23 clinical conditions or treatment processes, including improving asthma care, diabetes and reducing medication errors (Institute for Healthcare Improvement, 2011). The number of other organisations conducting their own Breakthrough Series collaboratives without the support of the Institute for Healthcare Improvement is not known.
1.3 Research Context

This research was conducted in the area of renal replacement therapy within secondary and tertiary care in regional healthcare provider. Renal replacement therapy is a collection of procedures where patients with failing kidneys are given substitute treatment either by haemodialysis, peritoneal dialysis or transplantation. These treatments can be provided in the community or at pre-determined dialysis facilities. The full context of this research will be explained section 3.2.

1.3.1 Quality in Renal Replacement Therapy

As with other parts of medicine, there have been significant advances in technology in renal replacement therapy over the past 20 years. Dialysis is now readily accessible in the Western world, and other complications of kidney failure can be treated using medications. Despite rapid advances in dialysis and transplantation, the health and outcome of patients undergoing any form of renal replacement therapy continues to be dismal.

There have been numerous observational studies which have looked at the possible factors relating to poor patient outcome. For example, the Dialysis Outcomes and Practice Patterns Study research team has published over 100 prospective, longitudinal observational studies of haemodialysis patients and facilities in twelve countries (DOPPS, 2011). These studies have shown that there are a number of clinical indicators – such as anaemia, adequacy of dialysis, blood pressure, albumin, infections and vascular access type – correlated with patient outcomes such as morbidity, mortality, hospitalisation and quality of life (Rocco, et al., 2006; Rayner, et al., 2007; Van Wyck, et al., 2010; DOPPS, 2011). Furthermore, there are subsequent interventional studies to find the best way to improve patients’ performance in these clinical indicators to improve their outcome.

Concerted efforts have been made worldwide to incorporate these findings into guidelines and, as a result, the standard now is such that patients have been given individual treatment targets (sometimes known as therapeutic goals) in each of these clinical indicators. Various care commissioners now will incorporate these clinical standards as part of reimbursement to renal care providers as a way to improve quality of care.
Another drive to improve quality has been the establishment of a renal registry in various countries, including the United Kingdom. The UK Renal Registry provides information regarding the performance of different organisations in providing care to patients on renal replacement therapy, thereby acting as a source of comparative data and benchmarking (Tomson, et al., 2008, Ansell et al., 2010). The UK Renal Registry has shown that there is significant variability across healthcare organisations in achieving these treatment targets, which cannot be explained based on patient factors such as the severity of illness and patient demographics. The variability of achievement is more likely related to the heterogeneous quality of care provided by different organisations.
Chapter 2: Literature review

2.1 Introduction

Over the past decade, collaborative methodology has gained significant acceptance within the health care community. Despite the increasing popularity, empirical research on quality improvement collaboratives has been relatively meagre (Schouten, et al., 2008; Mittman, 2004).

This chapter have been divided into five parts in order to better understand the literature concerning quality improvement collaboratives. These parts are research on effectiveness, research on specific elements of the Breakthrough Series collaborative, research on barriers to the collaborative, research on contextual factors affecting the collaborative and unpublished report on collaboratives. This chapter will also review the studies on quality improvement in specifically within area of renal replacement therapy.

In addition, this chapter will explore how our understanding of quality improvement collaboratives has been dependent of information gained from collaborative leaders, senior participants and managers of collaboratives. It will help to set the narrative for this study looking at frontline participant’s view on quality improvement collaboratives.

2.2 Studies on Quality Improvement Collaboratives in a Healthcare Setting

2.2.1 Studies on the Effectiveness of Quality Improvement Collaboratives

A proportion of published studies on collaboratives have centred on the effectiveness of this particular quality improvement methodology. These studies use a pre- and post- design similar to most other interventional studies in health care by treating the collaborative as an intervention and examining whether there is any significant statistical change to the intervention or collaborative group. Studies in health care intervention are encouraged to compare findings with a non-intervention control group as a way to eliminate potential bias. Some of the studies in the effectiveness of collaboratives have done this by various research designs, but this is not always the case.

In a systematic review, Schouten and colleagues extensively searched the literature on the effectiveness of quality improvement collaboratives from January 1995 until June 2006 (Schouten, et al., 2008). 72 published studies that report on collaboratives or their outcomes were found from 1104 abstracts initially found. From the 72 studies, only 12 articles were of a controlled study design – these represent
nine controlled studies, two of which were randomised controlled trials. The summary of these studies are in Appendix 1.

There were 12 articles for nine controlled studies, as two studies were reported more than once. The review found three studies showed positive overall impact, four studies showed positive impact on certain selected parameters and two studies showed no positive impact at all. The review came to the conclusion that that quality improvement collaborative has a positive but difficult to predict impact on clinical outcome and the evidence base underlying the collaborative remains limited.

The Health Foundation published a report that used systematic review by Schouten as the main source of information (Hulscher, Schouten and Grol, 2009). The report also performed an update to the review by searching the Medline database up to March 2008. The report found an additional study during this update (Howard, et al., 2007). Unsurprisingly, the report came to a very similar conclusion to Schouten’s systematic review.

There have been more reports published on the quality improvement collaborative since Schouten’s systematic review and since the Health Foundation report. A search using a similar strategy and MeSH terms to those in the Schouten review was performed in MEDLINE, EMBASE, Pubmed, Cochrane and PsychInfo databases and revealed 21 articles that reported on collaborative projects between June 2006 and August 2011. Out of the 21 articles found, only six were controlled studies, one of which was a randomised controlled trial. The summary of these studies can be found in Appendix 2. Three of these studies showed positive overall impact (including one randomised controlled trial); two of the studies showed improvement in some parameters measured and one study did not show any improvement at all.

This literature update shows that the evidence base behind the effectiveness of quality improvement collaborative projects remains limited, particularly when the biomedical research standard of comparing findings with control is applied. Quality improvement collaboratives have a positive impact on improving care, but it remains difficult to predict their effectiveness. This supports the conclusion reached by Schouten’s systematic review.

The literature update has its limitations; firstly, the search was limited to quality improvement collaboratives containing features as described in Schouten’s review so that consistent results could be
obtained. Another drawback is that the search was limited to English language journals and may have missed studies appearing in other languages.

There are other uncontrolled studies reporting on quality improvement collaboratives. Both Schouten’s systematic review and the Health Foundation report found 67 uncontrolled studies published in both management and subject-matter journals from 1996 to 2006. 85% of these uncontrolled studies were based on Breakthrough Series methodology reporting on a wide range of topics, predominantly in a hospital setting using mainly self-reported pre- and post-analysis of their improvement work. These studies have shown more mixed results: some show significant improvement, whilst others show no statistically significant improvement.

The updated literature search for this research found 17 uncontrolled studies published from June 2006 until August 2011. The studies found a similar pattern, where some collaboratives reported significant improvement but others showed no improvement to care.

A recent paper on a big observational study is worth discussing here; the study looked at the effectiveness of quality improvement collaboratives that were performed on various domains of care in less-developed and middle-income countries (Franco and Marquez, 2011). This study looked at data reported by 27 collaboratives (out of 54 funded) performed from 1998 until 2008 in 12 different countries. The authors analysed an average of 28 months’ worth of time-series charts collected by the individual collaboratives. The study showed significant sustained improvement can be obtained using the collaborative method within a short space of time. The main criticism of the paper is positive bias, as 23 collaboratives were excluded because of data issue and another four collaboratives terminated earlier than expected. It was unclear as to whether the collaboratives that failed to provide sufficient data were successful or failed to improve.

2.2.1.1 Methodological Issues Relating to Studies on Effectiveness

A more fundamental question is this: should the effectiveness of the collaborative be gauged only from controlled studies? Traditional biomedical research emphasises the use of rigorous research methods, such as randomised controlled trials, to evaluate the effectiveness of any intervention in order to eliminate bias and potential confounding factors. The proliferation of the evidence-based medicine movement over the past 20 years has elevated the importance of rigorous systematic review and meta-analysis, which makes controlled trials a prerequisite. However, applying this emphasis to quality
improvement research may not be as straightforward: there is well-documented tension between quality improvement research and how this can be interpreted using the evidence-based criteria (Shojania and Grimshaw 2004).

Different commentators have described the quality of available research on quality improvement collaborative as ‘poor’ and ‘methodologically weak’ when judged by the biomedical research standard (Mittman, 2004; Landon, et al., 2004). It is argued that the inconsistent results shown in collaboratives were likely due to methodological weakness, flawed reliance on subjective measurement and publication bias. This explains why there were a small number of studies identified by the systematic review as there are strict inclusion criteria of accepting only controlled trials.

Auerbach and colleagues put forward seven arguments against rapid dissemination of innovative quality improvement intervention (Auerbach, Landefeld and Shojania, 2007). The authors advised against ‘favouring action over knowledge’ and concluded that similar rigorous standards should be applied to quality improvement research and intervention as in the biomedical field.

On the other hand, Berwick argued that the quality improvement collaborative entails a process of social change (Berwick, 2008). Quality improvement collaboratives involve multifaceted complex interventions, unlike controlled trials, to test efficacy of a single drug or intervention (Shojania and Grimshaw, 2004). Controlled trials prevent generalisable theory to be developed as it is, by its very nature, designed to answer a question of whether one specific intervention works (Neuhauser, and Diaz 2007). Collaborative initiatives take place in a different environment, where the context and culture is different and cannot be controlled easily, contrary to controlled trials where protocol is strictly followed and contextual factors play little or no part. The use of randomisation in controlled trials is an admission of ignorance by not seeking knowledge about what causes variation and influences the outcome.

It is questionable as to whether the 15 controlled studies found are representative of the true experience of all quality improvement collaboratives. The small number of studies identified makes it difficult for a systematic review to draw a definitive conclusion on the effectiveness of the collaborative. Furthermore, as mentioned earlier, the nature of how the studies were performed makes it difficult to draw any generalisable conclusion that can be extrapolated to other future collaboratives.

Another contentious issue is whether lumping together collaboratives that intervene in different domains of care and analysing them together is good science (Lindenauer, 2008); biomedical research
would certainly never combine the findings of different drug trials in heart disease, diabetes and skin cancer together and analyse them to look for pattern of effectiveness.

In summary, there is some evidence from controlled and uncontrolled studies on collaboratives that have shown some positive impact, but it is still difficult to predict which collaboratives can be successful and the evidence base underlying it remains limited. Despite the varying evidence in its effectiveness, collaborative methodology has been widely accepted and applied in many different countries as a way to introduce and accelerate quality improvement.

2.2.1.2 Alternative Ways to Evaluate Quality Improvement Collaboratives

Is there another way to evaluate quality improvement collaboratives? Traditional biomedical research follows the positivist tradition, which promotes rigorous experimental scientific evaluation using established paradigm and method. Berwick suggested using other scientific methodologies available that can be used to evaluate collaboratives in a different light (Berwick, 2008). An example of an alternative model to evaluate intervention involving social programmes was proposed by Pawson and Tilley, where context and mechanism around an intervention is taken into account (Pawson and Tilley, 1997).

Qualitative process description of what happens in a quality improvement collaborative has been lacking, which leads to the comparison of the collaborative with a ‘black box’ (Wilson, Berwick and Cleary, 2003; Schouten, et al., 2008). The term was first coined in the 1980s by researchers involved in evaluating social programmes to describe how the perspective of evaluating a complex intervention as a unified whole is akin to viewing the contents of the intervention as a ‘black box’ (Palmer and Hargreaves, 1996). In order to better understand how the collaborative works, opening the ‘black box’ is necessary: the key to understanding is to appreciate the external factors and internal context of a collaborative (Wilson, Berwick and Cleary, 2003). There has been little research trying to understand why some collaboratives work but some don’t. Further knowledge of what occurs in setting up and running a collaborative is important to help interpret the results of a collaborative.

2.2.2 Studies on the Elements of a Collaborative

As discussed in the previous section, studies on the quality improvement collaborative have shown inconsistent results regarding its effectiveness when measured using standard experimental or pre- and post- methods following the positivist research paradigm.
Researchers have looked at the quality improvement collaborative through a different research paradigm in order to better understand why certain collaborative projects work well and some don’t. One approach has been looking at specific elements of the collaborative and how these correlate with success. A collaborative usually consists of specific elements in its methodology: for example, the Breakthrough Series methodology contains eight specific elements ranging from topic selection to measurements.

There have been two papers identified that directly looked at how each element contributes to the success of a collaborative (Kilo, 1998; Nembhard, 2009). The study by Nembhard consisted of a survey and semi-structured phone interview from four collaborative teams participating in the Institute for Healthcare Improvement collaborative. The study looked at which element of the collaborative was perceived to be most useful to the participants and how it has helped the learning process. The study found that expert faculty, solicitation of ideas during learning sessions, change package by expert faculty, plan-do-study-act cycles and learning session interaction and collaborative extranet were useful elements to advance their improvement effort. The study also found that features enabling inter-organisational exchanges such as collaborative faculty, interactions during learning session, listserv discussion, monthly report exchange and the monthly conference call were rated higher by successful teams. Although the study identifies which features of the collaborative are most helpful, it fails to answer whether the individual collaborative elements contributed to the success or failure of teams.

On the other hand, the paper published by Kilo was a descriptive study broadly describing the elements of Breakthrough Series collaboratives and how these elements can help future improvement efforts (Kilo, 1998). The author used the learning from several collaboratives performed by the Institute for Healthcare Improvement to formulate their own opinion, which forms the bulk of the study. There are other published papers which indirectly looked at the collaborative elements by looking at key critical success factors that can influence a quality improvement collaborative (Øvretveit, et al., 2002; Wilson, Berwick and Cleary, 2003; Ayers, et al., 2005).

These studies looking at elements of collaborative mainly derived their information from collaborative leaders and individual team managers.
So, what did the studies show about elements of quality improvement collaboratives? Table 2 provides a summary of the findings of these studies. The studies commented that correct topic selection is essential to drive change during the collaborative work. The right topic must be able to eliminate the gap between knowledge and practice, with a high-level performance available to learn from; it must also be strategically important for the organisation (Kilo, 1998; Øvretveit, et al., 2002; Wilson, Berwick and Cleary, 2003). The expert faculty should be made up of credible subject matter and application experts to formulate guidance or evidence-based changes for the improvement team to follow (Øvretveit, et al., 2002). Enrolment of the teams is a crucial element for a quality improvement collaborative. Participating teams need to be developed and prepared to deal with any changes to their membership and leadership made by the project team (Øvretveit, et al., 2002; Wilson, Berwick and Cleary, 2003). Composition of the participating team can help particularly if the team is multidisciplinary and constant throughout the improvement work.

Learning sessions are the fundamental element in a quality improvement collaborative. The sessions need to help develop basic competence in quality improvement methods and change concept to help the team commence their work. The sessions should also emphasise learning and sharing as this can help participants to adopt ideas different to their local organisation (Øvretveit, et al., 2002). The Model for Improvement is a pragmatic way for the participants to facilitate change, and the small tests of change enable participants to conduct any alteration safely (Kilo, 1998). Rigorous use of measurement can help to accelerate improvement (Kilo, 1998). The participating teams should be encouraged to own their measurements and be trained to handle their own data (Øvretveit, et al., 2002).

Table 2. **Collaborative Elements and How they Help Improvement**

<table>
<thead>
<tr>
<th>BTS Collaborative elements</th>
<th>Authors</th>
<th>How it influences success</th>
</tr>
</thead>
</table>
| Topic selection           | Kilo (1998)  
                            Øvretveit et al. (2002)  
                            Wilson, Berwick and Cleary (2003) | • Choose the right topic necessary to drive change  
• Topic must eliminate gap between knowledge and practice to improve care  
• Example of high-level performance should be available in topic  
• Strategically important with potential financial savings  
• Broad topic leads to better innovation but specific topic more feasible for rapid improvement |
| Expert faculty | Øvretveit et al. (2002) Nembhard (2009) | • Expert faculty member needs to be credible in the eyes of participants  
• Subject experts provide evidence-based changes for participants  
• Measurable and achievable targets set by faculty team  
• Faculty as a source of information |
• Each team needs clear definition of roles and expectations  
• Continuous team forming and building before and during should be expected during collaborative |
• Develop team competence in quality methods and change concept so that they can be adopted locally  
• Equip team to deal with data and change  
• Learn and plan to spread and sustain improvement  
• Emphasis on learning and sharing with other teams is more useful |
| Action period | Nembhard (2009) | • Monthly conference call and web discussion useful for learning  
• Application of model for improvement to allow small changes |
| Facilitation & contact | | |
| Model for Improvement | Kilo (1998) Nembhard (2009) | • Model is a pragmatic way to facilitate change  
• Small tests of change provide a safety net to learn  
• Model helpful to improve implementation knowledge |
| Summit & Publication | | |
| Measurement | Kilo (1998) Øvretveit et al. (2002) | • Rigorous use of measurement accelerates improvement  
• Ownership of measurement by individual teams |

### 2.2.3 Research on Determinants of Success

Researchers have used different paradigms to help improve our understanding of why certain collaboratives work whilst others fail. Researchers have looked at determinants of success associated with different collaborative work by formulating their argument based on the experience of individual collaboratives, expert opinion and formal research. Determinants of success are factors and characteristics relating to a collaborative, rather than the specific elements that have a positive influence to a collaborative. The presence or absence of these determinants of success could influence the outcome and potentially explain why certain collaboratives work but others fail.
The Health Foundation produced a report on collaboratives where it systematically reviewed published evidence on the determinants of success of a quality improvement collaborative (Huslcher, et al., 2009). The report found six published papers looking into this and summarised its findings into five main sections of topic of collaborative, the ideas and support for improvement by experts, the critical mass of multi-professional teams from multiple sites, the model for improvement and the structured activities for improvement, exchange and sharing.

The six papers identified were of varying sources. Four of the papers were of expert opinions based on the author’s experiences with different quality improvement collaboratives.

There were two papers that were based on original research (Wilson, Berwick and Cleary, 2003; Ayers, et al., 2005). Wilson and colleagues carried out a semi-structured interview on 15 collaborative leaders to ascertain their views on what determinants the leaders thought were critical in influencing the effectiveness of the collaborative (Wilson, Berwick and Cleary, 2003). The authors identified seven themes that were important determinants of success: sponsorship, topic, ideas for improvement, participants, senior leadership support, preliminary work, and strategies for learning about and making improvements. The variability of how each theme was implemented can influence the success of a collaborative. For example, in the case of participants, inclusion of multidisciplinary staff with previous quality improvement experience was beneficial to a project, rather than voluntary participation of a single type of staff.

Ayers and colleague performed a semi-structured interview on 18 key informants from 10 different successful collaboratives to identify shared patterns and characteristics that were critical to the success of the improvement work (Ayers, et al., 2005). The research looked in-depth at how the structural and process dimension of a collaborative relates to success. The authors suggest that the human dimension, beyond team-building and empowerment, within a project was crucial in determining its success. They also identified other factors that were shared in successful collaboratives: nonlinear development, attendance to organisational culture, integrated philosophy of quality improvement and a focus on process and outcome measurement to drive change. The authors produced a guideline for the development of a successful collaborative by amassing the research findings from the various interviews. For example, the authors suggest that meetings (in the domain of structure) should be face-to-face and should be conducted regularly within a specific timeframe.
There are recurring themes in the literature that determine the success of a collaborative. The studies found that good execution of certain collaborative elements determines the success of an improvement work. Good topic selection helps to create tension to change; a good topic should be one that has a large variation of care and one that generates national interest. Activities in the collaborative such as learning sessions and web or phone conferences need to be tailored to ensure mutual learning and improvement of participants’ knowledge on implementation, measurement and data handling (Øvretveit, et al., 2002; Wilson, Berwick and Cleary, 2003; Ayers, et al., 2005). Sponsorship of the teams and support from senior leadership within participating team organisations is crucial to maintain the momentum for change (Kilo, 1998; Wilson, Berwick and Cleary, 2003). Participating organisations need to support the improvement teams by allowing the use of time and resources during the collaborative work (Kilo, 1998; Wilson, Berwick and Cleary, 2003).

Table 3 below provides a summary of the determinants of success identified by the studies mentioned above.
### Table 3. Summary of Studies Looking at Determinants of Success in a Collaborative

<table>
<thead>
<tr>
<th>Author</th>
<th>Type of publication</th>
<th>Main Findings on Determinants of Success in Collaborative</th>
</tr>
</thead>
</table>
| Plsek (1997) | Expert opinion based on experience of various collaboratives | Collaborative group:  
• Participation of multiple organisations with varying levels of success  
• Collaborative group formed on the basis of well-defined indicators  

Activities, Exchange and Sharing for Improvement:  
• Bringing understanding of local practice and processes to the collaborative  
• Open sharing of performance and knowledge between organisations  
• Training staff in quality improvement skills and techniques  
• Benchmarking of practice to identify best practice by performing site visits  
• Ownership and continuous implementation of measurement during project |

| Kilo (1998) | Expert opinion based on experience of various collaboratives | Topic Selection Criteria:  
• Ripe topic area that has tension on a national level  
• Gap exists between best available evidence and current practice  

Role of Improvement Experts:  
• Input from established, well-known experts  

Collaborative group:  
• Critical mass of participating organisation  
• Support in form of time and resources from organisation  
• Senior executive commitment from organisation  
• Team varies in size and composition but should be represented by system leader, technical expert and day-to-day leadership  

Use of Model for Improvement:  
• Good use of model for improvement by focusing on clear aims and rapid cycle of change  

Activities, Exchange and Sharing for Improvement:  
• Emphasis on building capabilities to perform measurements and continuously collect data |
<table>
<thead>
<tr>
<th>Source</th>
<th>Description</th>
<th>Topic Selection Criteria:</th>
<th>Role of Improvement Experts:</th>
<th>Collaborative group:</th>
<th>Activities, Exchange and Sharing for Improvement:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kilo (1999)</td>
<td>Experience from a collaborative project and expert opinion</td>
<td>- Topic selection with large variation of care</td>
<td>- Leader with good national reputation to head the collaborative</td>
<td>- National call for participants with motivation and willingness to improve</td>
<td>- Synergy of scientific knowledge and improvement knowledge to create drive</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>- Planning group decides on measurement</td>
<td>- Multidisciplinary team working in synergy to improve</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Øvretveit, et al. (2002)</td>
<td>Consensus opinion from two expert meetings</td>
<td>Topic Selection Criteria:</td>
<td>Role of Improvement Experts:</td>
<td>Collaborative group:</td>
<td>Activities, Exchange and Sharing for Improvement:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Gap between knowledge and practice should exist, and topic should be strategically important to drive change</td>
<td>- Clear definition of roles and expectations of experts</td>
<td>- Continuous team forming and building occurs in collaborative</td>
<td>- Participants define their objectives and assess capacity to benefit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Motivating and empowering teams is crucial</td>
<td>- Emphasis on mutual learning rather than carrying out teaching</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Teams typically include a team leader, a clinician, an opinion leader and a quality specialist</td>
<td>- Provide team with measurable and achievable targets</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Equip team to deal with data and change</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>- Learn and plan to spread and sustain improvement</td>
</tr>
</tbody>
</table>
| Wilson, Berwick and Cleary (2003) | Interview of collaborative leaders | **Topic Selection Criteria:**  
- Broad topics attractive to external funding and lead to more innovation  
- Specific topics more conducive for rapid improvement  
- Unfamiliar topic less likely to be successful or attract participants  

**Role of Improvement Experts:**  
- Expert groups with practical knowledge of problems is essential  

**Collaborative group:**  
- Multidisciplinary membership of improvement team  
- Inclusion of physician in team  

**Use of Model for Improvement:**  
- Good support from senior leadership is essential  
- Sponsorship crucial to success by improving credibility of project  

**Activities, Exchange and Sharing for Improvement:**  
- Good preliminary work and learning prior to collaborative  
- Training participants on quality improvement theory & technique  
- Readiness for change of each participant is crucial to drive success  
- Sharing improvement strategies between participants facilitates improvement  
- Competition between participants is important  
- Central support from project team drives improvement more rapidly but can create dependency  |

| Ayers, et al. (2005) | Interview of key informants of multinational collaborative | **Collaborative group:**  
- Cultivating trust in organisation and collaborative leads to more improvement  
- Attention to human dimension by fostering social connection  
- Plan for growth of collaborative by changing composition and integration of new and established members  
- Attendance to organisational culture such as involvement of multidisciplinary team  

**Activities, Exchange and Sharing for Improvement:**  
- Integrate quality improvement philosophy within day-to-day work  
- Focus on process outcome and measurement |
<table>
<thead>
<tr>
<th>Study</th>
<th>Methodology</th>
<th>Collaborative Group:</th>
<th>Activities, Exchange and Sharing for Improvement:</th>
</tr>
</thead>
</table>
| Meredith, et al. (2006) | Multi-method process evaluation of collaborative group | • Support from leadership is important for implementation  
• Right staff should be in the improvement team and physician should be included |  
Activities, Exchange and Sharing for Improvement:  
• Extra effort from staff important to push changes |
| Newton, et al. (2007) | Participant observation, Reflective journal review and key informant interviews of a collaborative group | • Adequate resources should be allocated by organisation  
• Strong support from senior leadership is crucial to success |  
Activities, Exchange and Sharing for Improvement:  
• Important to get the teams to be familiar with small tests of change |
| Nembhard (2009) | Survey and semi-structured phone interview of collaborative participants | Activities, Exchange and Sharing for Improvement:  
• Collaborative faculty, solicitation of ideas, change package, plan-do-study-act cycles, learning session interaction and collaborative extranet promote general and improvement knowledge that is essential for success  
• Features enabling inter-organisation such as collaborative faculty, interactions during learning session, listserv discussion, monthly report exchange and monthly conference call were rated more useful by successful team | |
| Lemay et al. (2010) | Interview of team leaders and team members | Collaborative group:  
• Support from key leaders in the organisation |  
Activities, Exchange and Sharing for Improvement:  
• Learning sessions should deliver information about guidelines  
• Linking with other teams to share resources  
• IT support to develop and use patient registry  
• Direct involvement of patient in the work |
2.2.4 Studies on Barriers to Collaboratives

Researchers have also looked at barriers encountered during an improvement work to help better explain the varying effectiveness of collaboratives. The presence of these barriers could influence the outcome of a collaborative and could explain why certain collaboratives fail to deliver improvements to care.

Although there have been many studies looking at barriers to quality improvement, only a few specifically looked at barriers relating to collaborative work. Three studies were identified from the literature that looked directly at barriers to quality improvement collaboratives. The findings of the studies are summarised in Table 4.

<table>
<thead>
<tr>
<th>Author</th>
<th>Method</th>
<th>Main Findings on Barriers Encountered during Collaborative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gandhi et al. (2000)</td>
<td>Survey of physician leaders</td>
<td>• Lack of time and resources to work on improvement project</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Lack of incentives to improve</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Poor leadership of teams</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Inability for teams to create intervention relevant to other teams</td>
</tr>
<tr>
<td>Meredith et al. (2006)</td>
<td>Multi-method process evaluation &amp; semi-structured phone interview</td>
<td>• Lack of leadership support</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Staff resistance to change</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Difficulty with IT or technical system</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Time constraints</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Difficulty finding staff with appropriate skills</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Challenges with staff and continuity</td>
</tr>
<tr>
<td>Newton et al. (2007)</td>
<td>Participant observation, reflective journal review and key informant interviews of a collaborative</td>
<td>• Poorly resourced improvement team</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Weak senior leadership</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Attempting to create changes that are too large scale and unrealistic</td>
</tr>
</tbody>
</table>

Researchers conducted a multi-method process evaluation of an Institute of Healthcare Improvement-sponsored collaborative for depression and a telephone interview of its participants from 17 different sites (Meredith, et al., 2006). The study looked at facilitators and barriers to improvement and analysed the data obtained using quantitative analysis. The respondents in the study identified a number of barriers in their collaborative work, such as difficulty with poor leadership support, IT or technical system problems, time constraints faced by the improvement team and local staff resistance to change. The study did not explore each of the barriers reported in depth, as data was analysed using a
quantitative method. Bivariate analysis in the study showed that lack of leadership support was the only barrier significantly affecting perceived success of the project.

Another group conducted a survey of physician leaders in eleven participating teams, where they found that the main barriers to their improvement work were lack of time, lack of resources and poor leadership of the improvement teams (Gandhi, et al., 2000). The study also did not explore these barriers in detail as the data obtained were analysed using a quantitative method. On the other hand, researchers on the Chronic Care Collaborative conducted a multi-method qualitative study on a single site experience of a state-wide quality improvement collaborative (Newton, et al., 2007). The study identified three themes relating to barriers to the quality improvement collaborative: poor resources given to the improvement team, weak leadership of organisation and attempting to create change on a large, unrealistic scale.

In summary, there is an absence of literature that looks directly at barriers to the quality improvement collaborative. Despite this, four recurring barriers were highlighted by the literature: lack of senior leadership support, poor leadership of team, time constraints and lack of resources.

2.2.5 Studies on Contextual Factors Affecting Collaboratives

The healthcare setting is a complex system where actions and conditions of the environment, organisation, individuals and teams constantly interact with each other (Koeck, 1998; Plsek and Wilson, 2001). The varying results achieved by collaboratives and other quality improvement strategies have increased the appreciation of organisational complexities, the processes behind them and the environment, all of which can influence the implementation of best practice (Benn, et al., 2009; Krein, et al., 2010). Bate and colleagues put forward an argument that the traditional focus on identifying ‘what’ works rather than ‘how’ or ‘why’ something works has hampered efforts into understanding differences in quality (Bate, Mendel and Robert, 2008).

There have been some theoretical works that suggest that context affects organisational change, innovation, implementation and knowledge translation (Greenhalgh, et al., 2004; Damschroder, et al., 2009). Context is the environment or setting in which the changes in a collaborative can be implemented. The PARIHS framework is a conceptual framework that incorporates key elements that
influence successful implementation of evidence-based practice. In this framework, context is comprised of four sub-elements: receptive context, organisational culture, leadership and evaluation. However, the use of this framework to help implement changes prospectively is unclear as a recent systematic review revealed that the framework has been predominantly used in post hoc studies (Helfrich, et al., 2010).

Understanding how context and organisational and change management links to quality improvement collaboratives can help to open the ‘black box’. There has been little research specifically looking at whether or how the contextual factor affects collaboratives, and the studies tend to only involve the leaders of participating organisation. A cross sectional survey on national collaboratives showed that organisations with a more open culture and a greater emphasis on quality improvement attempted more interventions and interventions that were more comprehensive (Deo, et al., 2009).

Kaplan and colleagues published a systematic review on the influence of context on the success of quality improvement work in healthcare (Kaplan, et al, 2010). The paper reviewed studies that used a variety of quality improvement approaches in their work such as continuous quality improvement, lean, collaborative and self-labelled methods. Eight studies from the review used the collaborative method as a framework for improvement. Two examples of such studies were performed in the Veteran Health Administration programme, which showed that strong organisational support, strong team leadership, high levels of interpersonal team skills, experience with quality improvement, teamwork skills, and skills gained from the project can help the improvement team to achieve their desired aim (Mills and Weeks, 2004; Neily, et al., 2005).

Table 5 below summarises the contextual findings of the studies focusing on collaboratives that were identified by Kaplan’s systematic review.
Table 5. **Summary of Contextual Factors that can affect Quality Improvement Collaboratives (derived from Kaplan, et al., 2010)**

<table>
<thead>
<tr>
<th>Quality Improvement team / Internal context</th>
<th>Organisational / External context</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Strong team leadership</td>
<td>• Strong organisational support and leadership</td>
</tr>
<tr>
<td>• Interpersonal team skills</td>
<td>• Open leadership and management support</td>
</tr>
<tr>
<td>• Presence of improvement champion in areas</td>
<td>• Organisations with a more open culture</td>
</tr>
<tr>
<td>• Feasible group climate and mix</td>
<td>• Organisations with a quality improvement culture</td>
</tr>
<tr>
<td>• Established quality improvement skill</td>
<td>• Good data management system</td>
</tr>
<tr>
<td>• Perceived organisational support</td>
<td>• Sufficient financial, time and general resources</td>
</tr>
</tbody>
</table>

2.2.6 Unpublished Reports on Collaboratives

It is worth mentioning two unpublished comprehensive evaluations of quality improvement collaborative despite good evidence obtained from published literature. These two comprehensive evaluated the use of Breakthrough Series collaborative within orthopaedic and cancer services within the National Health Service (Bate, Robert and McLeod, 2002; Robert, McLeod and Ham 2003).

The Orthopaedic Services Collaborative was a quality improvement collaborative which involved 37 hospital trusts with an overarching aim to ensure patients undergoing hip replacement surgery receive efficient, effective, timely and patient-centred care (NHS Modernisation Agency, 2002). The main objective that was chosen by majority of the participating teams was to reduce length of stay relating to hip surgery performed in the participating Trusts. The evaluation of this particular collaborative combined both quantitative data analysis and qualitative methods such as observation of collaborative events, telephone and face-to-face semi-structured interviews of central project team and project managers from participating hospitals (Bate, Robert and McLeod, 2002).

The Orthopaedic Services Collaborative showed a positive outcome by reducing the length of stay after hip surgery in most of the participating Trusts, where the mean postoperative length of stay decreased by one day (12.2%) within one year of intervention. The evaluators found that there were variations in achievement of the outcome amongst individual Trusts where the participating team with the best
reductions in length of stay made more changes than other participants. The evaluators also found significant waste in terms of withdrawal of a fifth of participating Trusts and high turnover of project managers.

The evaluators also identified a few problems in the collaborative – these problems were mainly difficulty in communication between collaborative leaders and teams in setting the aim, difficulty in getting agreement to define data needed from each participating hospitals and inability to decide on requirements for reporting results obtained. The evaluation found that the Breakthrough Series method itself was well accepted by the participants and its success depend on whole range of factors and conditions such as context of participating organisation, preparation before commencement of collaborative and training of participants in organisational development and change management.

The next unpublished evaluation involved the Cancer Services Collaborative which was a complex service improvement and redesign effort using Breakthrough Series methodology involving fifty one different projects working on five tumour types across nine different regional cancer networks (Kerr, et al., 2002). The main aim of the collaborative was to improve the experience and outcomes for patients with suspected or diagnosed cancer by optimising care delivery systems.

The evaluation of the first phase of this improvement collaborative involved both quantitative and qualitative data analysis (Robert McLeod and Ham, 2003). Two standard global measures which were waiting time from referral to first definitive treatment and summary data of booking activity were analysed using quantitative method. The evaluation also involved analysis of four sources of qualitative data. These were semi-structure interviews with participants and stakeholder, focus group work with participants, postal questionnaires from national leaders of the collaborative, programme managers and clinical leads and documents and observation of meetings and collaborative activities. The evaluators found that there was marked variation of positive result amongst participating teams in relation to both waiting times and booked appointments. For example, two prostate and three colorectal cancer projects showed progress in reducing waiting times but nine projects in breast, lung and ovarian cancer stream did not show improvement.

Despite this, the evaluators found that over two-thirds of respondents to the postal questionnaire stated that additional local benefits were realised during the collaborative. Examples of these informal benefits include spreading the collaborative approach and techniques to other departments and
organisations, helping staff development and motivation and encouraging multidisciplinary team working.

The evaluation found that the overall view on the method used in this collaborative was positive. The most helpful components of the collaborative were process mapping, national improvement workshops, dedicated project management time and training on capacity and demand. On the other hand, Listserv, conference call, team self assessment and improvement theory were felt to be less useful by respondents. This was similar to the findings by Nembhard (Nembhard, 2009).

The evaluation also found six key levers for change that helped to propel the collaborative work. These levers for change include adoption of a patient perspective using process mapping and patient views, availability of dedicated project manager with time to work on the project, opportunities for training, facilitation of multi-disciplinary team working, empowerment of staff, and opportunities for networking. Furthermore, the evaluators identified two main barriers to change. The first barrier to change was that the requirements for data collection and measurements were unclear where some participants doubted the validity and usefulness of the measures. The other main barrier identified was that participants found the theoretical elements of the collaborative were unhelpful and may explain the slow start to the improvement work.

2.2.7 Studies on Quality Improvement in Renal Replacement Therapy

This study is conducted in a quality improvement collaborative working on area of renal replacement therapy (further explanation is available in the research method section). There have been many published reports of various quality improvement initiatives in the area of renal replacement therapy. However, there has been little published specifically on quality improvement collaboratives in renal replacement therapy. Van der Veer and colleagues systematically reviewed over 5000 titles published since 1990 on planned attempts to improve quality of care in renal replacement therapy (Van der Veer, et al., 2011). Ninety-three quality improvement initiatives were identified in and accepted into the systematic review; however, there was only one initiative that used quality improvement collaborative as the method of choice (Strott, et al., 2004; Nguyen, et al., 2007). The ‘Fistula First’ initiative was a collaborative effort to improve the fistula rate amongst haemodialysis patients. The initiative used their own specific collaborative method which is similar to the Breakthrough Series in many ways. This
particular improvement work was not picked up by Schouten’s systematic review: this might be due to the different MeSH term used to index these two studies.

The authors of this systematic review found that multiple implementation strategies are more effective than a single strategy in achieving a result, and noted that the quality improvement collaborative uses this approach to improvement. Furthermore, the authors found that the most frequently used strategies are patient-orientated and staff-orientated. The former might reflect the fact that patient compliance and empowerment is central to the chronic care management model, and the staff-orientated strategy was more suitable to the multidisciplinary nature of renal replacement therapy care.

2.3 Summary

The quality improvement collaborative stems from the natural evolution of effort to improve healthcare and bridge the quality gap. It has gained widespread popularity, despite the unpredictable and ‘less than robust’ evidence of its effectiveness. Its popularity might be related to two main reasons - its ability to be applied to a wide range of topics, and due to the belief within the healthcare system that improvement teams are more likely to be effective when working together on a topic.

Due to its heterogeneity, it would be difficult to adopt a similar biomedical model of rigorous research methodology to analyse the quality improvement collaborative. Therefore, the appropriate paradigm needs to be engaged. An outcome-orientated research may not be the most appropriate method to analyse the collaborative. The focus should be what makes certain collaboratives work by trying to open the ‘black box’ covering the collaborative.

Most studies in understanding elements of the collaborative and the contextual factors affecting it have derived their data from collaborative leaders and key representatives. There has been no published study that derived data from frontline staff participating in the collaborative. Furthermore, there has been little qualitative study to describe the process of what actually occurs and influences the set-up and running of a collaborative, in particular, through the point-of-view of frontline staff in the improvement teams.

Therefore, this dissertation will try to improve understanding of the quality improvement collaborative by evaluating the process behind it.
Chapter 3: Research Method

3.1 Introduction
The literature review section summarised the studies surrounding the quality improvement collaborative which provides the framework for this research. This chapter will discuss how the decision on the research method was made and will explain in detail the method chosen for this research. This chapter begins with a detailed reflection on the underlying philosophy of medical research follow by discussion on how an interpretive paradigm can help to understand the gap in the literature.

As mentioned earlier in the literature review section, there have been many reports of quality improvement initiatives in the literature on the area of renal replacement therapy. A significant proportion of these initiatives involve ‘traditional’ improvement strategies such as audit, educational programme or patient engagement. There has been little use of formal quality improvement technique in the area of renal replacement therapy and only two reports on the use of quality improvement collaborative methodology in this clinical area. This research is unique as it will provide a good opportunity to understand whether the nature of care provision and work can influence the outcome of a collaborative.

Furthermore, this research will look at frontline participant’s view on the process underlying quality improvement collaborative as nearly all published studies used information given by leaders or managers within an improvement collaborative.

3.2 Research Setting
This research was performed on a quality improvement collaborative that used the Institute for Healthcare Improvement’s Breakthrough Series methodology. It is appropriate to conduct a study on a collaborative that uses the Breakthrough Series as this is a common quality improvement collaborative method used in healthcare. The findings obtained in this research can potentially be applied to other collaboratives.
3.2.1 Salford Renal Network

The quality improvement collaborative work was carried out in Salford Renal Network. Kidney care in Greater Manchester is provided via the Greater Manchester Kidney Care Network, which in turn is organised into West and East sectors. Salford Renal Network provides the service for the West sector, which serves a population of 1 million people in the Greater Manchester, Bolton, Wigan, Rochdale and Oldham geographical area.

Figure 3 – Map of renal services in Greater Manchester

The Renal Network provides a wide range of kidney services such as in-patient acute care, out-patient clinics for various kidney disorders and renal replacement therapy. Renal replacement therapy is the main service provided by the Renal Network, and is the service in which most of the staff in the network is employed.

Salford Renal Network is directly managed by Salford Royal Foundation Trust, a local foundation trust that provides secondary and tertiary care to the Salford region. Salford Royal Foundation Trust can be
described as a ‘high-performing’ healthcare organisation; it has been given a number of awards in recognition of its success:

- The trust was rated excellent by the Care Quality Commission
- It has one of the lowest Hospital Standardised Mortality Ratio in the country
- It was voted Board of the Year at the NHS Leadership Awards
- It won an award for Top Teaching Trust in England by Healthcare 100.

The trust has an established quality improvement programme which permeates throughout the organisation. It has its own quality improvement directorate to help roll out many initiatives – such as Saving 1000 Lives, Reducing Avoidable Harm by 50% and Care of the Acutely Unwell Adult – across the Trust.

3.2.2 Collaborative in Kidney Replacement Therapy

The stakeholders from the Salford Renal Network met up in December 2008 to discuss the network’s performance. The meeting was initiated as part of a strategy by senior leadership to improve quality of care delivered across the network. The stakeholders concluded from the analysis of the network’s performance that it had been inadequate based on the reported clinical standards in the UK Renal Registry. These clinical standards have been shown by various studies to have a significant affect on patient’s outcome. Salford Renal Network has consistently occupied the bottom half in most clinical standards over the past few years. This under-performance is in contrast to the parent organisation, Salford Royal Foundation Trust, which is a ‘high-performing’ Foundation Trust that delivers excellent quality of care.

As a response, Salford Renal Network has commenced a quality improvement programme to improve its performance in these clinical standards and improve quality of care given to patients. The stakeholders in Salford Renal Network understand that it would require continuous improvement over a number of years before the network is able to uplift most of its performance to the high standard envisaged. To begin the improvement process, Salford Renal Network has decided to set-up a quality improvement collaborative called ‘Collaborative in Kidney Replacement Therapy’ to improve the network’s performance, specifically in the areas of haemodialysis, peritoneal dialysis and renal transplantation. The long-term plan by the renal network is to have multiple cycles of improvement using the
Breakthrough Series collaborative methodology to improve the network’s performance on all the reported clinical standards in the UK Renal Registry. The aim is to get Salford Renal network to provide the best dialysis and transplant care in the country by getting the network performance to top 10% of UK Renal Registry in all clinical standards within five years.

This initiative in Salford Renal Network can be considered a small- to medium-sized collaborative, in which five different areas of the network participated:

- Salford Haemodialysis Unit
- Bolton Haemodialysis Unit
- Wigan Haemodialysis Unit
- Community Dialysis – provides peritoneal dialysis and home haemodialysis service to the whole of Salford Renal Network
- Transplant team – provides pre- and post-transplantation care to the whole of Salford Renal Network.

Despite all the participating teams being under the management of Salford Royal Foundation Trust, each team was unique as they work with different rules, culture and geographical area.

The Collaborative in Kidney Replacement Therapy has been given a task to improve the Renal Network performance on key clinical standards that have been shown to improve the outcome of renal patients. The main aim of the collaborative is to bring the Renal Network performance on different clinical standards into the top 10% of performing renal networks based on the UK Renal Registry by April 2011. This aim was agreed during the stakeholder meeting held prior to commencement of the collaborative.

In order to achieve the main aim, each participating team have been given a specific aim, which has been set by the expert faculty, to achieve by April 2011.

- Salford Haemodialysis Unit – 60% of haemodialysis patients achieve blood pressure below 140/90
- Bolton Haemodialysis Unit – reduce catheter-related bacteraemia rate by 50% to 1 infection every 120 days
- Wigan Haemodialysis Unit – 95% of haemodialysis patients achieve a urea reduction rate (a measure of dialysis adequacy) above 65%
• Community Dialysis – 65% of peritoneal dialysis patients achieve haemoglobin range of 10.5 – 12.5 gm/dl
• Transplant team – 98% of attending transplant patients will have a cardiovascular risk assessment annually

The collaborative is managed by a project team that consists of two senior clinicians from the Renal Network who act as the project co-directors. The co-directors provide leadership and support to the collaborative. Figure 4 below shows the organisational structure of the collaborative.

They are supported by a Clinical Research Fellow, who has three main roles in this collaborative: First, the Clinical Research Fellow is responsible for the day-to-day running of the collaborative. The clinical fellow also acts as a facilitator for the project by working with the five improvement teams. The facilitator role is crucial to the collaborative as the Clinical Research Fellow acts to:

• help the team to find solutions to problems with implementation by promoting the use of quality improvement techniques and using change management strategies
• conduct certain elements of the collaborative which requires additional skill and time that the teams may not have: for example, a literature review for the Expert Faculty to review
• collect necessary measurements for the individual improvement teams until they are skilled enough to conduct their own measurements
• help to solve clinical problems encountered during the improvement work when necessary.

The final role of the Clinical Research Fellow is to lead on research on the collaborative work. It means that the Clinical Research Fellow also the researcher and author of this study. This dual role can potentially impact on this study – this will be discussed in the next section 3.2.3.
In each participating area, there is a multidisciplinary improvement team that will lead the quality improvement work in their respective area and work collaboratively with other teams to achieve their given aim. Each improvement team is made up by multidisciplinary frontline staff working in the individual areas that are selected by the respective unit managers. The project team was not prescriptive about the composition of the teams, but rather gave the managers of participating units a ‘job description’ that explains the necessary individual and team attributes that will make a successful team. This decision is based on two premises. First, the project team felt that the unit managers would be in a better position to pick which staff should be in the improvement team as they would know them better. In addition, each clinical standard that has been allocated to each team requires different individuals from the multidisciplinary team to participate. For example, improving blood pressure requires the active participation of the renal dietician, as patients will need counselling regarding salt and fluid intake, whilst improving infection mainly requires participation of frontline nurses. Therefore, each improvement team has a different consistency according to what their unit manager perceive is required to help their team achieve their improvement aim. The second reason for asking the unit managers to pick their own improvement team is to enable ownership of the improvement work. The project team believes that allowing each unit to shape their team will help them to feel that they own the improvement work rather than feel that it is driven by others from outside.
At the start of the collaborative project, the project team found that the individuals selected to be in improvement teams are a mix of staff that volunteered or asked by their unit manager to participate.

The collaborative approach was chosen because the method has been used extensively in Salford Royal Foundation Trust to try to improve quality of care and reduce harm across the hospital. Salford Royal Foundation Trust has its own quality improvement directorate that has individuals with extensive experience on collaborative methodology which the renal network can utilise.

In order to accelerate improvement within the renal network, the collaborative uses a modified version Breakthrough Series methodology where each participating team is given a clinical standard to improve on. This is different in comparison to the standard Breakthrough Series where all the teams work on one topic together for nine to twelve months. The central project team and expert faculty felt that all the clinical parameters suffers from similar implementation issues and rapid improvement can be made by addressing these generic problems.

As discussed earlier in this chapter, the improvement collaborative is part of a long-term improvement work by Salford Renal Network, where multiple yearly follow-on cycles of improvement using modified Breakthrough Series collaborative methodology has been planned. Because of this, the central project team has made a decision to handle the main measurements using established automated computerised data system in the beginning of the project before handing this over to individual improvement teams later on as the project progresses. The project team feels that handling the measurement in a staged manner is justified for three reasons: First, the individual improvement team consist of frontline staff working in busy clinical environment that limits the time they can spend on the project work. The second reason is that the central project team understands that the frontline staffs, through previous experience working with them, is more interested in making changes for benefit of patients and learning skills relating to change and project management. The final reason is that most frontline staff has little or no training on measurements and information technology skills which will take time for them to acquire during the project. However, the central project team will ensure that the improvement teams have necessary training and exposure on measurement from the start of the project as measurement is a fundamental element in Breakthrough Series methodology. Improvement
teams will perform their own measurements on the effect of small tests of change that they perform from the start of the collaborative and feed this back to the central project team.

Despite of the modifications to the Collaborative in Kidney Replacement Therapy, the project has all the features consistent with a quality improvement collaborative that has been discussed in the literature review section 1.2.1 (Øvretveit, et al., 2002). More importantly, the project includes all the features and elements of Breakthrough Series methodology, enabling it to be called as one (Institute of Health, 2003). The two modifications to the improvement method have not excluded or prevented any of elements of Breakthrough Series from occurring during this project. The potential limitation or impact of this modification onto the findings of this study will be discussed in section 3.11.

3.2.3. The Researcher
The Clinical Research Fellow who is responsible for the facilitation and day-to-day running of the collaborative is also the researcher who conducted this study. The project is strictly supervised by collaborative co-directors which means that any changes made will need to be agreed by them before being applied.

The researcher is a trained medical doctor who uses common qualitative methods in day-to-day practice when engaging patients in clinical care. For example, the researcher use open interview and semi-structured interview methods as part of daily clinical work to obtain necessary information to help provide appropriate care to patients. The researcher has also been provided with qualitative research method and analysis training before and during this research process. The former has been provided as part of generic medical doctor’s training. Training during this research process has been obtained by attending sessions organised by Manchester Business School.

This dual facilitation and evaluator role do have potential benefit and potential detriment to the research and the kidney collaborative. This dual role helps the researcher to obtain a more in-depth understanding of the organisation that the collaborative is working in. By spending time working in the organisation running the collaborative, the researcher is able to obtain ‘inside knowledge’ of the culture and context within the organisation that the collaborative is taking place. In addition, the dual role enables the researcher to spend more time with individuals participating in the collaborative. This helps
to create a good rapport with staff that will be the research subject in this study and forms a strategy that can make the participants more open to the researcher. Furthermore, by participating in the day-to-day running of the collaborative, the researcher has full access to the project data including observations, minutes of meetings, team analysis and measurements from each improvement team. This will help to provide an all-rounded analysis of the research findings to help answer the questions posed in this study.

However, the dual role can potentially introduce ‘biases’ to the research and affect the validity of the findings. For example, the participants may choose not to disclose certain information as the researcher is also the facilitator for the improvement collaborative. The effect of this can be limited by sticking to the semi-structured interview.

Another potential issue relating to the dual role is whether it can affect the outcome of the collaborative. As this is an evaluation of the process underlying the collaborative, this research does not affect whether the kidney collaborative works. Furthermore, the project is strictly overseen by the project co-directors to ensure that this research does not interfere or influence the collaborative work.

There will be further discussion on this matter in section 3.10 trustworthiness and scientific rigour section.

3.3 Research Question

The purpose of this research is to improve understanding of how quality improvement collaboratives work in practice. The literature review has identified a specific knowledge gap due to the research paradigm generally adopted by standard biomedical research. In case of quality improvement collaborative, there is a lack of understanding of how different factors interact to influence the quality improvement collaborative. This research will evaluate and describe the process behind the set-up and running of the collaborative from the point of view of frontline staff working in the improvement teams.

The overarching aim of this study is to answer the following question: ‘How has the quality improvement collaborative approach been used by Salford Renal Network to implement changes and improve its services?’
This can be addressed by answering three questions:

1. How do the elements in the collaborative help the teams to achieve their improvement aims?
2. What are the key determinants that can influence the success of this quality improvement collaborative?
3. What are the barriers encountered during the collaborative work and how did the teams overcome the barriers?

The research will concentrate on obtaining this information from frontline staffs working in the quality improvement collaborative.

This chapter will describe the research position, methodology and methods used to help answer these research questions.

3.4 Research Paradigm

Biomedical research has its roots in the positivist research tradition, which is reflected by how the discipline favours the quantitative research method. This remains the case, and is reflected in how undergraduate and postgraduate biomedical education is structured around the positivist research tradition (Tavakol and Zeinaloo, 2004). The positivist research paradigm believes that science relies on observation and measurement to identify cause and effect. Positivism believes objectivity is crucial and achievable. In addition, variables are controlled so that biases can be avoided.

As discussed in the literature review section, researches looking at quality improvement collaboratives are dictated by a positivist paradigm – most research concentrates on answering the question of whether the collaborative is an effective way to improve care. The researcher tries to answer this by looking to evaluate outcomes of the collaborative as an intervention using the quantitative method in the process. The conclusion reached by analysing these studies was that collaborative work has a positive impact on clinical care but it is difficult to predict which collaborative can be successful.

Quantitative research is helpful in determining what intervention works: for example, which medications work best to prevent heart disease in a population. However, this research paradigm cannot answer why the compliance of medication is poor or how to improve uptake of medications in a population.
Specifically, two contentious arguments have been raised on using a positivist paradigm to evaluate the quality improvement collaborative (Berwick, 2008; Lindenauer, 2008). The first argument of contention has been noted earlier in the literature section – whether grouping together collaboratives as a single intervention when they actually intervene on various clinical domains that use different methods is good science. The second argument is that application of a complex social intervention in real life is very different from what actually happens in scientific trials. Controlling variables – for example, by using randomisation – ignores variation that can be important in real life, which might explain why certain collaboratives work but others fail. There are other research paradigms that can be used to evaluate the quality improvement collaborative. Interpretivism views the world as a dynamic and complex environment which is interpreted by people in their interactions with each other and with wider social systems. Interpretivism research favours qualitative research methodology, which tries to uncover the meaning of a phenomenon by studying why people behave in a certain way.

Inductive investigation using the qualitative research methodology can help to answer the questions that a positivist quantitative method is unable to answer – why do some collaboratives work, and what features and factors influence their success?

Table 6 below provides an example of the difference between two research paradigms. It highlights how the two paradigms look at reality, knowledge and research, which may explain the findings earlier in the literature review section.

Table 6. Differences between Positivism and Interpretivism (adapted from Guba and Lincoln, 2005)

<table>
<thead>
<tr>
<th></th>
<th>Positivism</th>
<th>Interpretivism</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ontological</strong></td>
<td>What is reality?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• An objective, true reality exists which is governed by unchangeable natural cause-effect laws</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Consists of stable, pre-existing patterns or order that can be discovered</td>
<td>• The world is a dynamic and complex environment, where interpretation depends on the experiences people have with their interactions with each other and with the wider world</td>
</tr>
<tr>
<td></td>
<td>• Reality is subjective, by which different people understand different reality</td>
<td></td>
</tr>
</tbody>
</table>
### Epistemological

<table>
<thead>
<tr>
<th>What is knowledge?</th>
<th>Knowledge can be described in a systematic way</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Knowledge consists of verified hypotheses that can be regarded as facts or laws</td>
</tr>
<tr>
<td></td>
<td>Knowledge is accurate and certain, and holds true for many people in many situations</td>
</tr>
<tr>
<td></td>
<td>Knowledge is based not only on observable phenomena, but also on subjective beliefs, values, reasons and understandings</td>
</tr>
<tr>
<td></td>
<td>Knowledge is constructed</td>
</tr>
</tbody>
</table>

### Methodological questions

<table>
<thead>
<tr>
<th>Role of research</th>
<th>Uncovering reality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Scientifically explain, predict and control phenomena</td>
</tr>
<tr>
<td>Study a phenomenon by understanding why people behave in a certain way</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Role of researcher</th>
<th>Objective; independent from the subject</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Investigator has control</td>
</tr>
<tr>
<td>Brings own subjective experience to the research</td>
<td></td>
</tr>
<tr>
<td>Tries to develop an understanding of the whole and a deep understanding of how each part relates and is connected to the whole</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Methods</th>
<th>Empirical and experimental</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Structured and replicable observation</td>
</tr>
<tr>
<td></td>
<td>Quantification / measurement</td>
</tr>
<tr>
<td></td>
<td>Unstructured observation</td>
</tr>
<tr>
<td></td>
<td>Interviewing</td>
</tr>
<tr>
<td></td>
<td>Discourse analysis</td>
</tr>
</tbody>
</table>

### 3.5 Research Methodology

In this study, a qualitative research approach was selected as this approach is considered the most likely way to provide answers to the research questions and bridge the knowledge gap discussed in the literature review. The methodology is best placed to be able to explore the underlying process behind quality improvement collaboratives as the approach follows an inductive reasoning, focusing on interpretation of phenomena by attempting to understand the interactions occurring in a particular situation (Denzin and Lincoln, 1994; Patton, 2002).

Qualitative research typically helps to reveal the nature of people, relationships and systems in different situations. It allows researchers to test the validity of assumptions within a real life context and environment. In addition, qualitative research provides the means which enable the researcher to gain insight into the effectiveness of particular practices and innovations in real life (Leedy and Ormrod,
Hence, one of the key strengths of qualitative research is that it studies people or interventions in their own environment, rather than creating an artificial setting. Therefore, the research question can be better answered by making use of this key strength to understand how the collaborative can be affected by the environment it is in.

This is in contrast with quantitative methodology, the foundation of which is to answer ‘what is?’ It tries to control and limit real life interference by using experimental design in its research and by avoiding trying to understand why and how the interference can influence the outcome.

There is an increasing use of qualitative research in healthcare settings where its usefulness reflects the key strengths of the approach (Pope and Mays, 1995; Kuper, Lingard and Levinson, 2008). Qualitative research is used to uncover complex social processes, such as evaluating organisational changes or understanding in a healthcare setting. Qualitative research can also help to validate and provide alternative interpretation obtained by quantitative data (Mays, 2006). For example, a study on patients’ decisions on whether to take blood pressure medications helped to explain why patients were not compliant on medications: surprisingly, the reason for non-compliance did not relate to pharmacology of the drugs (Benson and Britten, 2002).

### 3.5.1 Process Evaluation

An intervention can be assessed either by evaluating the outcome or the process underlying it. The quality improvement collaborative is a complex, multifaceted intervention that can be influenced by context, culture and other social factors. For this reason, evaluation of the quality improvement collaborative poses a research paradigm and methodological challenges (Oakley, et al., 2006; Berwick, 2008). Assessing the outcome of such complex, multifaceted intervention may yield potentially conflicting results; this is certainly what the literature has concluded on the effectiveness of quality improvement collaborative work.

Process evaluation is a systematic assessment of an intervention to examine fully what happens during the implementation process (Harvey and Wensing, 2003; Hulscher, Laurant and Grol, 2003). This method of evaluation can provide insight into how a complex, multifaceted intervention such as a collaborative is perceived and implemented in clinical practice, as well as experience and exposure to
the intervention (Hulscher, Laurant and Grol, 2003; Oakley, et al., 2006). For example, process evaluation can be used to find out whether participants experience any obstacle when implementing changes. By exploring this, valuable information could be gained to help understand and explain what was found in the literature on outcome evaluation.

Process evaluation has been used in assessing healthcare promotion and disease prevention programmes performed across a diverse range of the population. It has also been used to complement randomised controlled trials in order to help to interpret the findings of studies and proposed implementation strategy for the intervention that was researched (Baskerville, Hogg and Lemelin, 2001; Oakley, et al., 2006). Hulscher suggested that a process evaluation in quality improvement needs to explore three main enquiries (Hulscher, Laurant and Grol, 2003): first, what are the key features in an intervention that should be included that can help describe it well? Second, what features in the intervention can be used to measure the exposure of participants? Third, what are the factors experienced by participants that might influence the intervention, particularly causing it to be successful or lead to failure?

There are a variety of research methods that may be used to evaluate the process behind a quality improvement collaborative. In this research, a semi-structured interview will form the bulk of the data, but the researcher will also continuously perform observations and will have access to secondary data from the collaborative.

3.5.2 Semi-Structured Interview

Semi-structured interview was selected as a way to collect data based on three main considerations: firstly, the semi-structured interview is highly interactive and well-suited to explore opinions and perceptions of the subject in this complex intervention (Britten, 1995; DiCicco-Bloom and Crabtree, 2006). It allows the researcher to probe the subject for more information or clarification of answers, which will help to yield more quality data for the research. Secondly, research looking at evaluating a programme and the process underlying it requires the subjects to be honest and blunt with their answers (Britten, 1995; Curry, Nembhard and Bradley, 2009). The semi-structured interview helps to develop rapport between the researchers and subject so that the subject can provide their opinions without the fear of reprisal for negative statements.
Thirdly, an open, in-depth interview is difficult to perform in this setting as it is not easy to obtain enough data within the specific time and work limitation. Staff time is very limited due to the nature of their work, and clinical staff can potentially be disturbed, making it difficult to conduct a fully open interview. The semi-structured interview limits the effects of interruption as it helps to refocus the interview.

### 3.5.3 Existing Data and Secondary Data Sources

The project team in the Collaborative in Kidney Replacement Therapy continuously collect various data relating to the improvement work. These data consist of records on facilitative visits, records on tests of change, minutes of meetings, details of learning sessions, details of team analysis and performance analysis of teams. Analysing data from existing data sources and secondary data is an acceptable method to help complete a process evaluation (Rossi, Freeman and Lipsey, 1999; Øvretveit, et al., 2002). It can complement other data obtained during this study to help explain findings from the semi-structured interview.

### 3.6 Research Sample

The research sample consists of the five improvement teams within Salford Renal Network that are participating in the Collaborative in Kidney Replacement Therapy. As mentioned earlier in this chapter, each improvement team is made up of multidisciplinary staff members such as nurses, support workers, administrators, dieticians and doctors working in the particular area. Prior to the commencement of the collaborative, each participating area forms their own improvement team and the consistency of the teams is decided by their unit managers either by process volunteering or active selection.

The size of each improvement team varies. The size of the team is decided by each individual team, with different factors that influences the team size include the size (number of patients and total number of staffs) of the respective area the team is working in, the nature of the clinical standard that needs to be improved and the perceived need by the team. For example, the Salford improvement team is the largest as it has the biggest unit in terms of patient and staff numbers in order to deliver the changes needed for the collaborative work.
The team composition may vary over the collaborative year, depending on staff movement and what the team perceive they need. The improvement teams will decide themselves if they require individuals to be replaced or added in order to help to achieve their aim. The individual is regarded as the smallest unit of analysis due to the size of this collaborative and the ability of the researcher to access the staff.

The aim is to interview as many individuals in the improvement team as possible. However, three issues prevented all members from the improvement teams to be interviewed. The first issue relate to the limited financial resource and time for this study as there are not enough resources to interview all the participants. Secondly, the dynamic staff movement in and out the Renal Network means that staff can leave the improvement teams at short notice as they obtain work elsewhere or rotate to different care area. Staff can also leave the improvement team during sickness or maternity period. The final issue relates to the busy nature of the clinical environment as staff in this improvement collaborative works in the frontline to deliver clinical care in a demanding and stressful environment. This poses a problem to the researcher in obtaining interviews as staffs often finds it difficult to commit adequate time for an interview, and in some circumstances the interview can be interrupted due to problems in the clinical environment.

Due to these factors, a sampling strategy was put in place in order to get as much quality data from the participants as possible especially when all of the staff participating in the improvement team has never been in a quality improvement collaborative before. The project team keeps a record of contact made with improvement teams, minutes of meeting and attendances to collaborative events. These records help the researcher to know which individual in the improvement teams who have participated most and had most contact with the collaborative. It is presumed that these individuals who participated most will have more information on how the collaborative work and the process behind it to help provide better answer the research question. A priority list was created in which the interviews were prioritised to individuals who have worked the longest with the collaborative and who had the most contact with the collaborative and project team. Therefore, each individual has been approached systematically on the basis of this priority list.
Table 7 below summarises the sampling strategy by explaining the composition of the improvement teams, number of learning sessions attended, number of months spent in the collaborative work and reason why certain individual was not interviewed.

Table 7. *Summary of Participating Improvement Teams*

**Bolton Renal Unit Improvement Team**

<table>
<thead>
<tr>
<th>Staff</th>
<th>Learning sessions attended (out of 4)</th>
<th>Number of months in the collaborative (out of 12)</th>
<th>Interviewed?</th>
<th>Reason for no interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff Nurse A</td>
<td>4</td>
<td>12</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Staff Nurse B</td>
<td>2</td>
<td>5</td>
<td>No</td>
<td>Long term leave</td>
</tr>
<tr>
<td>Health Care Assistant A</td>
<td>4</td>
<td>12</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Unit Manager A (Team champion)</td>
<td>1</td>
<td>12</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

**Community Dialysis Improvement Team**

<table>
<thead>
<tr>
<th>Staff</th>
<th>Learning sessions attended (out of 4)</th>
<th>Number of months in the collaborative (out of 12)</th>
<th>Interviewed?</th>
<th>Reason for no interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialist Nurse A</td>
<td>4</td>
<td>12</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Specialist Nurse B</td>
<td>3</td>
<td>12</td>
<td>No</td>
<td>Lack of time and resource</td>
</tr>
<tr>
<td>Health Care Assistant B</td>
<td>4</td>
<td>12</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

**Salford Renal Unit Improvement Team**

<table>
<thead>
<tr>
<th>Staff</th>
<th>Learning sessions attended (out of 4)</th>
<th>Number of months in the collaborative (out of 12)</th>
<th>Interviewed?</th>
<th>Reason for no interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Practitioner 1</td>
<td>1</td>
<td>4</td>
<td>No</td>
<td>Long term leave</td>
</tr>
<tr>
<td>Staff Nurse C</td>
<td>3</td>
<td>12</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Staff Nurse D</td>
<td>1</td>
<td>6</td>
<td>No</td>
<td>Transfer out of Salford</td>
</tr>
<tr>
<td>Staff Nurse E</td>
<td>0</td>
<td>3</td>
<td>No</td>
<td>Transfer out of Renal</td>
</tr>
<tr>
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<td>3</td>
<td>No</td>
<td>Long term leave</td>
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<td>Dietician A</td>
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<td>12</td>
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<td></td>
</tr>
<tr>
<td>Dietician B</td>
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<tr>
<td>Doctor 1</td>
<td>2</td>
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### Table 7. Summary of Participating Improvement Teams

#### Transplant Improvement Team

<table>
<thead>
<tr>
<th>Staff</th>
<th>Learning sessions attended (out of 4)</th>
<th>Number of months in the collaborative (out of 12)</th>
<th>Interviewed?</th>
<th>Reason for no interview</th>
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<tr>
<td>Specialist Nurse C</td>
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<tr>
<td>Specialist Nurse D</td>
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<td></td>
</tr>
<tr>
<td>Specialist Nurse E</td>
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<td>No</td>
<td>Lack of time and resource</td>
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#### Wigan Renal Unit Improvement Team

<table>
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<th>Staff</th>
<th>Learning sessions attended (out of 4)</th>
<th>Number of months in the collaborative (out of 12)</th>
<th>Interviewed?</th>
<th>Reason for no interview</th>
</tr>
</thead>
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<td>Staff Nurse G</td>
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<td></td>
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<td>Staff Nurse H</td>
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<td>Lack of time and resource</td>
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<tr>
<td>Unit Manager B (Team Champion)</td>
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<td>12</td>
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### 3.7 Ethical Approval

Ethical approval was discussed with NHS SalfoR+D, an umbrella organisation responsible for research in Greater Manchester and Salford Royal Foundation Trust. NHS SalfoR+D has agreed that no ethical approval was necessary for this research as it was a non-interventional study involving only staff members participating in the collaborative for the purpose of quality improvement.

### 3.7.1 Informed Consent

Initially, individuals from the teams were given an information sheet to that explained the nature, aim method and confidentiality arrangement of the study. The potential participants were invited to attend the research interview; they could voluntarily agree or reject the invitation. Each individual was given a consent form to read through and was asked to agree to the first part of the consent form before the interview starts. Each potential participant was informed that the consent and information obtained during the interview could be retracted by them at any given time.
The typed transcript for was shown to each participant to ensure that they agree that the transcript reflect what the participant wanted to convey during the interview. The participants were also shown how they will be identified in the thesis. Each participant was then asked to sign second part of the consent form to allow the data to be used for this research.

3.7.2 Confidentiality

The interview transcript and research report only identifies the individual according to their respective team and role in their unit to ensure confidentiality. Despite this, there will be instances where an individual may be identified, for example, there is only one unit manager for each area, and thus the individual will be readily identifiable. These individuals have been informed on how they will be identified during the consent process and their transcripts will only be used when they have given second part of the consent. The voice recording and transcript is stored in a password-secured Trust computer to which only the researcher has access.

3.8 Data Sources & Data Collection

3.8.1 Pilot Study

An initial pilot study was performed on three individuals to see whether the structure and questions in the interview were appropriate to address the research query. The interview structure was developed by formulating it directly from the four research questions mentioned in an earlier part of this chapter. The questions were brief to enable the respondents to feel that it was an open-ended process.

| Box 3. **Pilot Interview Structure** |
| Where: Work Place                  |
| Timing: No limit                   |
| Questions:                         |
| 1. Tell me about your role in your unit. What is your role in the collaborative? |
| 2. What do you think works well and doesn’t work well in the collaborative? |
| 3. What helped and prevented you from improving care in your area? |
A few issues were unearthed during the pilot study. The subjects work in a busy clinical environment and they have very limited time to give for the interview. The interviews were often interrupted due to the nature of the clinical work. The interruptions led to all three interviewees losing their train of thought and the recording had to be replayed to them. In order to overcome this, the research interview was restricted to ½ hour as this was felt to be the maximum time that the subjects were able to accommodate due to the demands of their own day-to-day workload. The time limit enabled the respondents to ask other staff to cover their work to reduce interruption to the interview.

The pilot study used very broad questions, and further questions were asked depending on the responses. All three respondents gave short answers to these broad questions, needing a lot of prompting and explaining to obtain a good amount of information from them. The interview questions were changed as a result to help achieve a better quality of data.

3.8.2 Semi-Structured Interview

The semi-structured interview is to be performed with the individuals identified in the sampling strategy at their own workplace to make it easier for them to attend the interview. The interview is limited to 30 minutes due to lessons learnt during the pilot study. Before the interview begins, the researcher will go over the elements of Breakthrough Series methodology to help the respondent to better understand the interview question. The interview starts by asking the respondents to reflect on their experiences and interactions during the collaborative. This is then followed by a set of questions that are listed in the interview protocol:
The interview is recorded using an electronic Dictaphone and transcribed.

3.8.3 Existing Data and Secondary Data Sources

The researcher’s position as the facilitator for the collaborative enabled access to all data relating to the project. These data were used in conjunction with the interviews to help look into the collaborative process. Data available include:

- formal quantitative context analysis using AHRQ Patient Safety Survey
- quarterly team assessment using the Institute for Healthcare Improvement Collaborative Assessment and a self-created assessment tool
- unit & area staff data
- tests of change performed and problems encountered
- central project and improvement team minutes of meetings
3.9 Data Analysis

The interview transcripts were entered into NVivo version 8, a qualitative data analysis package. This software allowed the researcher to index segments of the text to particular themes, carry out complex search and retrieval operations quickly and link research notes to coding. However, NVivo does not interpret the data itself but merely aids the organisation of the interview data obtained (King, 2004). Initial coding of the interview data was performed by storing the relevant text and thoughts around it into a free node. Each free node was given a heading and all text relevant to that category was stored under that heading, creating a broad subset.

The interview data were analysed using template analysis. An initial template was created by coding the interview transcripts into broad themes based on themes identified in the literature review, research aim and interview questions. Familiarity with data by analysis of more interview data enabled the template to be further modified to produce more specific categories within each theme. Text stored in free nodes was moved into tree nodes when the categories become more defined. The use of free nodes allows exploration and comparison of data but it can destroy the bigger picture. The tree nodes help to show the relationships of categories with each other to maintain the overall perspective of the analysis.

The respondent attributes (role, team and gender) were tagged to each interview transcript to allow case study and cross-case analysis to be performed.

The existing data and secondary data sources were analysed in context of the data obtained by the interview analysis. These data will be used to supplement the findings obtained through the process above.

Each team data will be analysed individually at first (case study) by combining both analysis of interview data and other data types. A table will be constructed to document the themes identified in this research. This will then be followed by a systematic search for cross-case patterns (Voss, Tsikriktsis and Frohlich, 2002). A table will be constructed to document the themes identified and compare the similarities and differences to the literature. This will allow generalisability to be derived from the data obtained.
3.10 Trustworthiness and Scientific Rigour

The use of qualitative research in healthcare and health services has grown over the past few decades, accompanied by an increasing body of literature on its principles and practice on this particular method. However, questions remain on the scientific rigour of qualitative research. The main concerns that have been raised regarding qualitative research include the strong possibility of researcher bias, lack of reproducibility and limited generalisability as it tends to produce a large amount of data that is suitable for a small number of settings (Mays and Pope 1995).

The terms validity, reliability and generalisability originate from quantitative experimental research as a way to describe the trustworthiness of the study and the scientific rigour behind it. Validity refers to truthfulness of findings or best available approximation to the truth, reliability refers to the stability of findings and generalisability refers to how well the findings can be applied elsewhere (Whittemore, et al., 2001; Cohen and Crabtree, 2008).

There has been much debate on whether adopting these concepts from quantitative experimental research is appropriate. Some have argued that these concepts cannot be applied to qualitative research simply because of the difference in epistemological belief and research paradigm (Whittemore, et al., 2001; Rolfe, 2006). Others have argued that there is a need for a qualifying check or measure for research depending on the researchers chosen paradigm (Cohen and Crabtree, 2008; Golfshani, 2008). Researchers have developed analogous concepts and principles of trustworthiness in qualitative research. These are known as credibility, dependability and transferability (Shenton, 2004; Cohen and Crabtree, 2008).

Credibility of a study is analogous to the concept of internal validity in quantitative research. Credibility deals with how well matched the research findings are to the reality. It can be determined by assessing the degree to which it explains the phenomenon and how it fits with what is already known (Shenton, 2004; Cohen and Crabtree, 2008). Dependability refers to the extent to which researchers seek the means to describe the factors of instability, such as change of context and circumstance during the study (Graneheim and Lundman, 2004). Transferability refers to the extent to which the findings can be transferred to other settings or groups (Cohen and Crabtree, 2008).
There are various general and specific techniques to ensure trustworthiness of a qualitative research. These include explicit rationale for study design and justification of method, systematic sampling strategy, adequate researcher training and experience on data collection, documenting audit trail of analysis and presenting the findings using a well-described method. All of this has and will be covered in this thesis.

The researcher’s dual role can potentially lead to contamination, or what is known as bias in quantitative research. The use of a semi-structured interview helps to reduce this contamination, to ensure each subject is asked the same questions each time. The dual role has its benefit – it has made the researcher more familiar with the culture of the organisation and has helped to create a rapport with the subjects as the researcher works closely with them during the project. In a review on the trustworthiness of qualitative research, Shenton argued that prolonged engagement and development of rapport with subjects can help to gain their trust and improve the credibility of research (Shenton, 2004). He also argued that familiarity with the organisational culture can provide a different viewpoint in the research.

3.11 Limitations of Study
This study is not without its limitations. First of all, this study was performed in a small to medium collaborative in a secondary and tertiary care environment. The findings from this study can be useful for similar sized collaborative, but application to larger collaborative particularly outside secondary/tertiary care clinical areas may not be as straightforward.

The next limitation of the study is that the project itself used a modified collaborative approach rather than a standard Breakthrough Series methodology. Despite fulfilling all the characteristic of a collaborative, the modified approach may have influenced the results obtain in this study as the teams involved was working with five different clinical aim. Modification to the methodology might influence frontline staff’s opinion on collaborative work and therefore influence the way they answer the interview question. For example, staff opinion on topic selection may vary as each team was given different topics to work on. Future collaborative using the standard Breakthrough Series may find that the results of this study more difficult to interpret due to this modification. On the other hand, a
portion of the studies looking at collaborative were performed on other types of collaborative, as discussed in the literature review.

In addition, the sample was taken exclusively from staff working in renal service which might limit the generalisability of the findings. While renal services are similar to other healthcare areas where multidisciplinary work is the trend, the specialised setting may offer different patient and contextual factors. Therefore, the findings of this study can be useful to similar services configured the same way as a renal service, but for other type of service, the findings need to be adapted to the different area.

This study focused on looking at the collaborative process through the eyes of the frontline staffs involved. Although this helps by looking at a specific perspective of the staffs performing the improvement work, but this may give different findings to other studies that have been performed in the past as nearly all of them obtain information from project managers and opinion leaders in the collaborative.

The scope of the study was small due to the time and resources limitation. The study could have potentially looked at other themes such as organisational learning, learning process behind collaborative and leadership of improvement work if more time and resource can be obtained. These themes have been shown in other studies to effect how quality improvement collaborative work. The number of participants in the study was small too because of limitation to resource and nature of the clinical work involved in renal services.

This study used a sampling method to help prioritise which staff to interview. As mentioned earlier, the sampling strategy is necessary due to the nature of the renal service where combination of dynamic staff movement and the busy nature of frontline work prevent the researcher from interviewing everyone involved with the collaborative. Furthermore, this study has limited financial resource and time which make the sampling strategy more important. The sampling method prioritises staffs who have been working longest with the collaborative and a consistent sampling strategy is essential to show trustworthiness of a qualitative study. However, this sampling technique can potentially introduce what is termed in quantitative research as positive bias (or inclusive selection bias). In this study, it seems that the sampling strategy has lead to a situation where individuals who most engaged with the
collaborative appeared to be those who has been interviewed. This strategy may have indirectly influenced the results of this study as staffs who have been working the longest with the collaborative may have certain opinion on the interview questions asked. However, based on the participant summary in table 7, the three main reasons why participants were not interviewed were because they moved out of the renal service, long term leave (either sickness or maternity) or due to constraint in resource. Therefore, despite the potential selection bias, the sampling strategy was deemed the most appropriate way to maintain dependability of the study as it acknowledged the likely potential change in circumstances of participants in the collaborative before the study began.
Chapter 4: Results

4.1 Introduction
The chapter will outline the analysis of data obtained during this research. Data from each team will be analysed individually at first, followed by a cross case analysis.

4.2 Bolton Renal Unit

4.2.1 Data from existing and secondary sources
The unit
Bolton Renal Unit has 25 staffs working to provide haemodialysis service for 72 patients. They are supported by two renal consultants and a renal dietician. There was 12% staff turnover during the collaborative year and the unit had an average of three staff vacancies throughout the year.

The improvement team
Bolton Renal Unit began their work with two staff nurses and one healthcare assistant in their improvement team. The team composition changed six months into the project when one of the staff nurse went into maternity leave.

Improvement team meetings
The team met once every one to two week, where the unit manager helped to ‘protect’ the time needed for this. The central project team attended total of 22 meetings. Analysis of the minutes revealed that the team spent most time discussing tests of change, implementing successful tests and scrutinising patient cases.

Facilitation
Bolton renal unit had 22 facilitative visits by the project team during the 12 months of the collaborative work.

Number of tests of change
The team performed 42 recorded tests of change in variety of areas that includes staff education, patient education, adopting protocols and new techniques to line care.
Outcome of improvement work

Bolton renal unit was given an aim to reduce haemodialysis-catheter related blood stream infection. In the year prior to joining the collaborative, the unit had an infection rate of 2.5 per 1000 catheter days. At the end of the collaborative, the unit managed to reduce its infection rate to 0.45 per 1000 catheter days. This team had 81% reduction in haemodialysis-catheter related bloodstream infection.

4.2.2 Data from Semi-structured Interview

4.2.2.1 Data on Elements of Collaborative

The respondents found 3 elements of the Breakthrough Series methodology were useful during the improvement work. These elements were learning sessions, Model for Improvement and summit. The respondents have some criticisms on some elements of the collaborative such as action period and expert faculty.

Expert faculty: The respondents felt that the one of the unit that acts as the expert faculty was very useful to help create impetus for change across the unit.

‘I think the Newry team just came in and sort of – blew us away really – didn’t they? Just to be able to tell us what they do. And I think when we went on that visit to Newry – they are not doing anything magical are they - ? But what are they doing that they get such good results? And I think that was really good ‘food for thought’, and made us really look at our practice.’ Unit Manager A, Bolton.

Learning session: Two respondents felt that the learning sessions provided an excellent way for the team to share their experience and learn from each other on how to improve. They felt that the sessions were crucial to the success of their work.

‘The learning session helps, I think we couldn’t really do without then. We really do need them to go forward. They are very helpful. When we meet up with Salford, we have discussion and we can see what other teams have done, and their presentation.’ Health Care Assistant A, Bolton.

The learning sessions also provided a platform for individual to improve communication skills.

‘I think Roy has really enjoyed stepping up and giving a presentation. He would never have done that 12 months ago so it’s been a real learning experience for him.’ Unit Manager A, Bolton.
One respondent said that she didn’t learn much from the learning session, mainly due to her learning method.

‘I found it quite long and it was quite a big...having to get the staff to have a full day off and find time to go and, I don’t know, I didn’t feel I learnt a lot. You do get some ideas when you asked the other teams if you mention some problems you encountered and they had some ideas to give on how to improve but basically I didn’t find it that helpful really. I’m hands-on, I want to be doing things’ Staff Nurse A, Bolton.

**Action Period:** The respondents acknowledged that the action period allowed the team to focus on performing tests of change. During that time, contact using email was useful for the team as a way to communicate during that period.

‘Another thing that is handy is the emails. Sometimes when we can’t get to the phone, the email is very handy, they are quick really.’ Health Care Assistant A, Bolton.

The respondents said that phone and web conference was deemed not to be helpful. The main reason quoted was the technical difficulty faced during the sessions.

‘Well I wasn’t really involved during the call, but I didn’t get anything from that really’ Staff Nurse A, Bolton.

‘It’s easy to find things that work, not what doesn’t work. The only thing I could think at the moment, is the conference call. Maybe we can do with it a bit better, getting more organised next time, getting the right phone so that everybody in the team can hear it.’ Health Care Assistant A, Bolton.

**Model for Improvement:** All respondents found that using Model for Improvement helped them to learn whether the changes were appropriate and how to introduce it. The model also helped the team to introduce changes in more manageable way.

‘I think the small test of change, the PDSA works really well and I know that was the team struggled with at first because they weren’t able to actually write down on paper and predict what was going to happen but I think they’re good. Cause it’s only on a small group of people. Some of the changes we make we couldn’t have done across the unit – we would only use one or two people and I think that works really well.’ Health Care Assistant A, Bolton.

‘Obviously the test of change the more you do and you see the results from your small test of changes, and learn whether the changes work or not.’ Staff Nurse A, Bolton.
Summit: The unit manager felt that the summit was a good way to celebrate success. It was also a good way to spread learning for the team to improve further after the collaborative.

‘Yeah, well I think it’s really good because you’ve got a head start really on the next phase because we learn from what the other area has done and achieved, and I think it saves a lot of time I think that’s been good. It also good way to celebrate our success.’ Staff Nurse A, Bolton.

4.2.2.2 Data on Determinants of Success

The respondent’s opinion on determinants of success can be divided into internal and external factors to the improvement team.

Looking at internal factors, the respondents felt that their team composition and leadership of the improvement team were the factors that helped them through the collaborative work.

Team composition: Respondents felt that the having the right staff in the team has helped them in their improvement work.

‘We have a really good team behind us really helps. Plus, our team have a good mix really. That really helped us throughout the year.’ Health Care Assistant A, Bolton.

The team actively tried to improve team composition by identifying individual role in their teams and their skills can be fully utilised.

‘Everybody got something different to the table, each has their own way. We didn’t know in the beginning, but later on, we learnt our own role. The Belbin helped, yeah, in some ways, helps us to find our role in team At the start, when we were panicking that we wouldn’t get the goals we want, I think when we start anything new, sometimes its hard to get our head around. Over time, yeah, you can, it does come together. Couple of weeks fly by, before we know it, we need to meet next dateline.’ Staff Nurse A, Bolton.

Leadership of improvement team: Two respondents identified that leadership was an important factor in the improvement work. The leadership shown by one particular nurse has been singled out as one of the factor that helped the team to co-ordinate their work.

‘J is wonderful, she gets a lot of the work done. She organises and co-ordinates everything.’ Health Care Assistant A, Bolton.
‘I leads the team here. I think she has been a good leader. I think professionally for her own development and personal development I think she’s come on in leaps and bounds. She’s always been a bit reticent about coming forward but I think the collaborative has almost given her permission to step up and I think she has done a really good job. I think she has – that’s my own opinion’ Unit Manager A, Bolton.

The respondents identified two determinants of success external to the improvement team. These two factors were staff engagement and support by senior leadership and management.

Staff engagement: Good engagement of the staff in the unit was a factor that has helped the team to be able to drive their improvement work. The engagement was multi-faceted through patient story, staff meeting and using a notice board.

‘The weekly meetings and so all the staff were involved and they brought up any areas that we needed to maybe change or think again at test change’ Health Care Assistant A, Bolton.

‘I think it’s...because we’re basically concentrated on the patient’s story and why they are doing what we’re doing and I think that was a big plus. Knowing your patient and knowing what they go through when they do develop bacteraemia I think that was the main thing to get the staff on our side.’ Staff Nurse A, Bolton.

The team also used success as a way to engage all the staff in the unit – this way done by putting up visuals on the days between infections across the unit.

‘I think the fact as well that people can see the results on the board. I think that gives them a sense of pride as well – you know ‘look at what we’ve done and how well we are doing’. When you can see your successes then that makes you want to carry on.’ Unit Manager A, Bolton.

Support from senior leadership and management: The respondents felt that the support given by the unit manager and other senior leaders were crucial in their improvement work. Such was the support given by the unit manager that the team felt she was very ‘hands-on’ with the project, for example by helping the team to find the finance needed to perform tests of change.

‘At the beginning of the collaborative when we got our Unit manager as our champion and she was very much behind the collaborative and so any changes she was very supportive especially with the
financial...things that I wouldn’t know where to start with and she was very supportive with that.’ Staff Nurse A, Bolton.

4.2.2.3 Data on Barriers to Collaborative

Respondents didn’t have much to say about what has hindered their work during the collaborative. Only two barriers were identified by the respondents include lack of quality improvement knowledge and finance.

**Lack of quality improvement knowledge:** The unit manager felt that the lack of quality improvement knowledge amongst the team did slow the team down in the beginning. However, the unit manager commented that learning sessions and the facilitation given have helped to improve the team’s quality improvement knowledge.

‘That’s why the facilitation and the first learning session – you need that because you need some direction and I think, again, sometimes some of the meeting we have had with you – you’ve been able to give us focus and direction and maybe we were kind of going off in a little tangent.’ Unit Manager A, Bolton.

The two staff in the team didn’t find that their work was hindered with the lack of knowledge in the beginning, and they were able to pick up the quality improvement knowledge quickly during the project.

‘Not really, sometimes if I’m honest with you its hard to get my head around, maybe it’s me. It’s interesting. Whoever put it together, I find it very interesting, very useful. It doesn’t really stop me though, not having any experience. I learnt a lot.’ Health Care Assistant A, Bolton.

‘I think initially you might need some training if you’ve never had any involvement in quality improvement work before, but it doesn’t long to pick it up.’ Staff Nurse A, Bolton.

**Finance:** The respondents felt that they had to delay implementation of some changes because of lack of funding. For example, the team had to wait until necessary funding was secured before they could implement dialysis connector to the whole unit.

‘Money is a problem. Sometimes, when stock is not always ordered, and not come on time, that can be a bit of a problem. It can stop us trying things. We have things for trial period, and if we want to go further, to get more results from it, for example we stop at two weeks but we want to go through more, we can’t get the stuff.’ Health Care Assistant A, Bolton.
The problem with funding was solved by the unit manager. ‘Well we had the Unit manager on board with that and I don’t know what she did to get the funding for that, but and the collaborative I think you ended up involved in that as well didn’t you.’ Staff Nurse A, Bolton.
4.3 Community Dialysis Team

4.3.1 Data from Existing and Secondary Sources

The Community team

The community dialysis team has 9 staffs working to provide care for patients 150 patients who are on home-based peritoneal and home-based haemodialysis therapy. They are supported by a renal consultant and a renal dietician.

The turnover of staff in the unit was around negligible and they did not have any vacant post during the collaborative year.

The improvement team

The improvement team consisted of two specialist nurses and one healthcare assistant and there was no change to the team composition during the collaborative period.

Improvement team meetings

The team meet up every fortnight to discuss their improvement work. Analysis of the minutes revealed that the team spent most time discussing problems encountered during the work, planning tests of change and implementing agreed changes.

Facilitation

The team had 18 facilitative visits by the project team during the 12 months of the collaborative work.

Number of tests of change

The team performed 24 recorded tests of change in variety of areas that include patient education, system and prescription change.

Outcome of improvement work

Community dialysis team was given an aim to improve management of anaemia by getting 65% of their patients achieving haemoglobin within range of 10.5 to 12.5 mg/dl. Prior to joining the collaborative, only 35.4% of their patients were achieving this clinical standard.
The run chart below shows that the team achieved their improvement aim 10 months into their work. By the end of the collaborative, the team has shown 84% improvement in their allocated clinical standard.

Figure 5 - Result of Community Team’s Improvement Work

4.3.2 Data from the semi-structured interview

4.3.2.1 Data on Elements of Collaborative

The interviews identified three elements of the Breakthrough Series methodology that the respondents found useful during the collaborative work. The elements were learning sessions, Model for Improvement and summit.

**Expert faculty:** Both respondents said that the framework provided by the expert faculty was helpful to guide them through the collaborative way of working. The framework also provided systematic way for the team to find solutions to a problem that they have failed to solve for a number of years.
‘I think the framework was really good, we had a lot of support from it when we needed. Particularly, with something new to us all really.’ Specialist Nurse A, Community.

I think it gave us direction. Because everybody’s trying to change the anaemia process for years and it’s never worked, but this has give us that step to take and given us a frame to actually work on. Health Care Assistant B, Community.

**Learning session:** The learning sessions were useful to help motivate and re-energise the team by spreading enthusiasm across the teams and by comparing their work with other teams in the collaborative. The respondents felt that this was crucial especially when things weren’t working well during the project.

‘Yeah, I think you can take snippets out of that ‘cause they all involve different things. But I think somebody else, if they’re enthusiastic about it then that tends to rub off on everybody else and you can think, “Oh well, we can try that.” So yeah, that’s how they think out.’ Health Care Assistant B, Community.

‘The learning sessions really work, they were really useful. It is just a really good way, to see what everybody else is doing and just re-energise yourself where you up to, what you need to do, gives you the drive again which was good, particularly in the middle where everybody was a bit demoralised.’

Specialist Nurse A, Community.

The sessions provides a way for the team to dissect their work in more detail and by doing so they can learn and push forward more changes to their improvement work.

‘The morning part where we discuss how the teams have progressed, where we could go forward, some of the mistakes that we’ve made, because you forget those as you’re trying to push forward. And I think that just gives you the incentive to move that bit more forward afterwards. So it encouraged us to go a bit further.’ Health Care Assistant B, Community.

The respondents felt that the sessions were useful for the team as it provide a platform to share and learn from other team experiences. Learning about barriers faced by other team and being able to ‘pitch-in’ the discussion on potential solutions was crucial to their improvement work.

‘Because we thought, “Oh, we’ve hit a barrier now and we can’t go forward,” we found that the other teams also had, and that was encouraging in itself, to think, “Oh well, we’ve not gone wrong here, but we can move forward now”.’ Health Care Assistant B, Community.
‘I think sharing and learning how other people have done thing is really helpful, sometimes when you think that you are the only one with a particular problem, but it is really helpful to know that others faced the same barrier. Some of it are people are having definite barriers they are having to face it’s interesting because you are a step back from back to see whether you can help them and offer any suggestion people are very down wherever and since it drives other people down with them.’ Specialist Nurse A, Community.

The learning sessions uses a variety of teaching techniques, such as didactic lectures, sharing & learning and games in small group, to help deliver the contents across different spectrum of individuals in the collaborative. The respondents vary on their opinion on the way to deliver this content due to their style of learning.

‘I actually enjoyed the games and activities in the learning session, and I could see the benefit of doing them, it make you think about things, so I actually find it very useful when I did them. I think sometimes making people involved is good, and you manage to give the same message at the end of it, that’s what you need. The game is a good way to do it as it gets everybody interacting and break down barriers between us especially when some of us don’t know each other.’ Specialist Nurse A, Community.

‘One thing I didn’t like was the actual games in the afternoon. I understand why we have them but I just think we could have got more learning in on those sessions. That’s just my opinion. I think on the first one it did because that was like an ice barrier, but then, for me, personally, I’d have rather had more of the teaching side of things as opposed to breaking off for that.’ Health Care Assistant B, Community.

**Action Period**: The respondent agreed that the action period was good to give the team time to perform tests of change. The team finds communicating using email was a good way to keep up to date with the project and it provides an alternative method compared to sit-down meetings.

‘The email is great, a quick and easy way to keep up to date with stuff. I suppose it’s different with other teams – I have no problem accessing my email at work and I make time each day as part of my role, but I suppose with other people it might not be the case. They might go weeks without checking their emails, and they might miss something. It’s a good way to keep up-to-date with stuff and speak with a lot of people quickly.’ Specialist Nurse A, Community.

‘Email is useful, it is, yeah. Because you’ve not always got the time to sit and chat to somebody but you can always pick an email up and reply to that. So that, for me, is good.’ Health Care Assistant B, Community.
The team felt that the phone conferences were not useful during the project. Respondents cited lack of visual contact and inability to hear others due to technology as reasons why they felt it wasn’t useful.

‘The phone conference is probably the only thing that we found the hardest, just because the difficulty practically trying to hear everybody else, to hear what they were saying, it is probably the technology or the phone that went wrong. I think maybe I like to see people face to face, and that just probably personal. That is probably my least favourite thing. That’s the only thing that doesn’t work for me, but mainly due to technical side.’ Specialist Nurse A, Community.

**Model for Improvement:** Both respondents said that using Model for Improvement helped them to improve their implementation knowledge. The model also helped them to introduce changes in more manageable way.

‘I would think sort of using; I think when we get together as a group, as a team, just our team here on the unit, I think really pushing ideas forward and setting small targets and small, achievable goals really works quite well. I think sometimes you think you can do it all very quickly and you have got big ideas. I think it has to be realistic, what we are doing.’ Specialist Nurse A, Community.

‘I think you should have quite specific ideas and I think that your time frame should be realistic and it should be small changes that are achievable. I think you have to have a time frame, obviously, but I think that’s the best way to work I think, really.’ Healthcare Assistant B, Community.

**Summit:** The respondents felt that the summit was a good way to celebrate success and made them feel more appreciated.

‘The summit was good as it is good idea to celebrate success since everyone has worked so hard.’ Specialist Nurse A, Community.

‘The summit was useful. Yeah. Because it is a big achievement, isn’t it, I suppose? But, yeah, I think so. It is a good way to celebrate.’ Healthcare Assistant B, Community.
4.3.2.2 Data on Determinants of Success

The respondent’s opinion on determinants of success can be divided into internal and external factors to the improvement team.

The respondents identified project management skills, team composition and teamwork as factors internal to the improvement team that can determine success of their collaborative work.

**Project management skill of improvement team:** The team felt that it was crucial for them to meet up regularly so that they could plan their improvement work to ensure the project moves forward. The team tends to meet informally due to the way their rota was scheduled.

‘At first we needed to meet up regularly, to help us focus us as well, discuss what we needed to do and distribute the work. I think we need to put up a lot of work in the beginning which paid off as it kept things on-going, so I think it is really useful at first to have more input but I think the team we all know what we are doing and what everybody else is doing.’ Specialist Nurse A, Community.

‘As a team we probably meet quite informally really, we probably might not sit down around the table but just catch-up when we are in the office regularly. We don’t meet formally every week, because there are weeks when we are not there at all but in an informal basis we talk about stuffs, seeing what we are up to and looking at our figures on how we are doing. We then see what needs to be done and make sure each of us are given something to do.’ Healthcare Assistant B, Community.

**Team composition:** Both respondents felt that they had the right individuals in the team and each individual brought different set of skills to achieve their goal in the project.

‘I think it is a good mix really. Because they’re quite keen on anaemia anyway, and they always was, so yeah, I think it is the right team.’ Specialist Nurse A, Community.

‘I think my role in the community team is adopted in the team. C & I work very similar way, we both are very organised, we probably both overlap in something we do, J is organised as well, but she is good at getting things done as well. We play with each other’s strength and delegate to appropriate person. It came from one of our learning session when we look at the Belbin, homing on our strength and our character, and utilise our skills.’ Specialist Nurse B, Community.
‘The different skills that each of us bring, I think. ‘Cause it’s the different skills and it’s the understanding. And then it’s somebody to actually go and take that forward and deliver what they’ve put into place really.’ Healthcare Assistant B, Community.

Leadership of team: Both respondents felt that the leadership of the team was crucial to help them through the project. Good leadership enabled the team to plan and co-ordinate their improvement work.

‘For the collaborative, the leadership has been there and H is very supportive anyway. I could always go to her, with anything, not just this, so yeah, that is really important, I think.’ Healthcare Assistant B, Community.

‘I think you just have to get somebody to take the lead – we are meeting at so and so time and plan, somebody will need to take control of that, and when we allocate that you know that you need to meet. Leadership of the team is important – we work well as a team and we get on, which is a good starting point.’ Specialist Nurse A, Community.

The respondents identified two factors external to the team that can influence success. These factors were staff engagement and support from management and senior leadership.

Staff engagement: The respondents recognised that good staff engagement was essential to help them succeed in their improvement work. They actively engaged staff within the renal network to bring the staff to their side to ensure that changes can be implemented easily.

‘Other colleagues are supportive of what we are doing, but at the moment they haven’t been involved much. That’s one of the thing that we wanted to address now – they are supportive of what we have done, but we need to get them more engaged. I think for the team you are working, our team is motivated and really enthusiastic which is great. So trying to tell them to do something new is not difficult, they are really keen to embrace new ideas but not everywhere is like that and it doesn’t take many people not willing to work with you to make life difficult for you.’ Specialist Nurse A, Community.

The team encountered some resistance from the clerical staffs during the project. The clerical staffs felt threatened with their work, as they believed that the team wanted to take their job away from them. The team recognised that this they needed to engage the clerical staff better by going for an informal chat and using education session.
'The only drawback I’ve found is that the EPO girls thought we was trying to take their job from them, so you get guilt there as well, don’t you? That was one of the barriers. And it’s educating the rest of the team that this is what we’re trying to do and why we’re trying to do it. And once they understood that, everybody’s been fine. We also went and had a chat and said, “This is what we’re trying to do. We’re trying to improve the overall process.” And once they was able to understand that, they was okay.’

Healthcare Assistant B, Community.

Support from management and senior leadership: Both respondents said that they were well supported by their manager throughout the improvement work. The support was an important factor to their success by providing them with guidance, giving them to spend time working on the project and enabling them to push through necessary changes in their improvement work.

‘We was automatically given that support. I can imagine in some areas it would hinder, but we’re very fortunately, we’ve not had that. And she’s supportive if you need the time to do it, you’ve got it, and we’ve had that support there.’ Healthcare Assistant B, Community.

‘I think you got to have support from the managerial level, definitely, you got barriers and they make everything you do so much difficult if they disagree or make your things easier if they agree. We have been lucky as L is our manager and she is already been on board. We also have D who is our PD lead who we got on board who really has helped us.’ Specialist Nurse A, Community.

4.3.2.3 Data on Barriers to Collaborative

The respondents identified two barriers in form of lack of time and permission to access information technology that have hindered their success in the improvement work.

Lack of time available: Lack of time was cited by both respondents as one of the barriers encountered during their improvement work. This was barrier was encountered in the middle of the project when they had issues with staff sickness and annual leave. They overcame this barrier by asking for help from their project champion and by organising their workload better.

‘The time initially, wasn’t a problem, but then we had sickness and such things when it became an issue. And, for me, that’s not been a barrier because I’ve not done as much as the other girls have. So I think the time, for them, has been, but now, since D has set the time aside to have monthly meetings, they do
find the time, so I don’t think that’s as much of an issue at the moment.’ Healthcare Assistant B, Community.

‘I think for us, the barrier that we face most is the time to do it but I think sometime we needed to just make sure that we make sure we put that time aside to meet, particularly because we didn’t meet regularly because of other commitment and we sort of paid the price of that in the beginning. When we got our heads around to the fact that we need to focus and meet regularly, that’s when we started to see improvement. So for us, we would say time is a barrier, but it was maybe more our organisational planning bit which we needed to focus on.’ Specialist Nurse A, Community.

Permission to access information technology: A respondent felt that a major barrier to their work has been inability to access online electronic patient records. The problem had been ongoing even before the collaborative work, but did have an impact as one of the respondent was unable to put her administration and IT skill to good use. The problem was not resolved despite support from her managers.

‘From my point of view, not having access to EPR (electronic patient record). You know the iSOFT. Because I’ve not been able to help the girls. Initially, when we needed figures and last EPO’s, I was not able to help them on that because I couldn’t get the access. So that’s been my biggest barrier and now I just think, “Well what’s the point, I can’t get the information that we’re working hard to get because I’ve just solely not got a password for it from there.” They are working on that but they’ve been working on it for the last eighteen months and got nowhere.’ Healthcare Assistant B, Community.
4.4 Salford Renal Unit

4.4.1 Data from Existing and Secondary Sources

The unit

Salford Renal Unit has 34 staffs working to provide haemodialysis service for 132 patients. They are supported by three renal consultants and two renal dieticians. There was 21% staff turnover during the collaborative year and the unit had an average of three staff vacancies throughout the year.

The improvement team

Salford Renal Unit initially began with five frontline staff in the improvement team: one advanced practitioner in-training (acting as band 7), one staff nurse, one healthcare assistant and two dieticians. The consistency in the improvement team changes significantly over the collaborative period – four team members left and additional four were recruited. At the end of the collaborative, the team consists of two staff nurses (band 6 & 5), one healthcare assistant, one administration staff and two dieticians. Three staffs left the improvement team because they left Salford Renal unit, to work elsewhere in Salford Royal Foundation Trust. Another staff member left the team because of long-term sickness. Five interviews were obtained in Salford Renal Unit.

Improvement team meetings

The team met 37 times within the year working in the collaborative, with 32 of those meetings facilitated by the project team. A major problem by faced by the team is inability to meet regularly to plan their improvement work, especially in the first few months. The team meeting tend to discuss problems surrounding the unit that affected their work.

Facilitation

Salford renal unit had 32 facilitative visits by the project team during the 12 months of the collaborative work.
Number of tests of change

The team performed 30 recorded tests of change, in which majority of it were testing implementation of protocol and changing the structure of work as part of improving reliability. For example, there were 12 recorded tests of change in implementation of a new nurse-led protocol in the unit.

Outcome of improvement work

Salford renal unit was given an aim to improve management of blood pressure by getting 60% of their patients achieving a pre-dialysis blood pressure of 140/90. Prior to joining the collaborative, the unit only had an average of 33% of their patient achieving this clinical standard.

The unit had to split into two as the project team felt that the unit was too big to manage and to help improve staff rota.

The run chart showed that there was little progress made in for 7 months of the collaborative. The respondents noted that re-organisation of staff into teams in November helped significantly to improve their result at that time.

Figure 6 - Result of Salford Team’s Improvement Work
4.4.2 Data from the Semi-structured Interview

4.4.2.1 Data on Elements of Collaborative

The respondents identified four elements of the Breakthrough Series methodology that were useful to them during the improvement work. These were learning session, action period, Model for Improvement and summit.

The respondents have some criticisms on some elements of the collaborative such as action period and expert faculty.

**Expert faculty** : The respondents said that they rarely use the framework given by the faculty during the improvement work. This is despite the respondents acknowledging that the framework was very informative.

‘Which one is the framework? Is it the driver diagram? That’s been good – that works well, I can’t say we used it all the time, but when we have used it, it helped to focus your thoughts and how you are going to achieve various different aim.’ Dietician A, Salford.

One respondent commented that the framework was only used when a test of change needed to be justified to other staff in the unit.

‘If I have to justify something I’ll refer to it. But there is certain things I wouldn’t have picked. But there was other things I would have thought was more important in the framework.’ Staff Nurse C, Salford.

**Learning session**: The respondents found that the learning sessions provide an opportunity to be able to interact with other teams by learning and sharing ideas. The learning sessions helped the team to get new ideas on test of change and how to overcome barriers encountered during the improvement work.

‘I find the learn and sharing great, because you’re talking to people who ... you’re all there because you’re all like-minded. You’re all there because you’re trying for better things. The interaction with the other collaborative team is good because it gave us idea to do test to change. Other people have tried different things that works for them.’ Health care assistant C, Salford.

‘I found a lot of the team working sessions were really good. Also, remembering why we were doing it and becoming enthusiastic and sharing with other groups to find out what was working for them and also just to give a bit of support as well.’ Dietician A, Salford.
‘I’ve been to Wigan a couple of times, in particular for this, and the daily goals and that has helped, just to see, and then you see how it actually is, not just the sort of, this is what we do and how well we do it. What, just you go there and say, “Actually your problems are the same as ours.” They can’t always do their daily goals.’

**Action Period**: The respondents acknowledged that the action period allowed the team to focus on performing tests of change. They felt the support and facilitation provided by the improvement team helped them to do this.

‘It works well in that we have tried various different PDSA cycles or small tests of change. We don’t have to do that many because we know what works and what doesn’t with educating patients’ Dietician B, Salford.

During that time, contact using email was useful for the dieticians as they have access to computers. Nurses don’t feel that it is helpful as they were not able to check it regularly. There was a reluctant to use email to communicate during the action period.

‘The emails is not really useful because if I can get to open my emails up, it will be good. Well you know how often I get to open them up, now and again. Bearing in mind I’m part-time, I’m in two and a half days.’ Staff Nurse C, Salford.

‘Emails are, definitely useful if I can check it But, I like visuals. I like to see people and to talk face to face so most times I prefer talking to the teams and yourself.’ Health care assistant C, Salford.

Phone and web conference was deemed not to be helpful. Two reasons were quoted by respondents were the difficulty with technical aspect of it and the need to visualise the person on the other lines.

‘The phone conference is probably the only thing that we found the hardest, just because the difficulty practically trying to hear everybody else, to hear what they were saying, it is probably the technology or the phone that went wrong. I think maybe I like to see people face to face, and that just probably personal. That is probably my least favourite thing.’ Dietician A, Salford.

‘I don’t know whether that’s because it’s just not something that we’re used to doing so maybe doing it on a more frequent basis would be useful or just the fact that you – I didn’t find the interaction as easy from the phone conferences.’ Why is that? ‘I guess because I couldn’t see the person talking to me.’ Health care assistant C, Salford.
**Model for Improvement:** Respondents found that using Model for Improvement helped them to make changes that is more manageable in a busy dialysis unit and within the limited time at their disposal. This was contrary to previous experience of introducing change in a large scale.

‘The test of change was useful, yeah, because it made everything more manageable and because that’s my way of thinking, is okay, I’ve got a problem, how can I get this in place? Right, we’re going to do that today, does it work? Because I can take little steps but I tend to take big steps as well and I leave … I know sometimes … sometimes it doesn’t work, but I do try to think of what will work because I have to physically do these things myself.’ Staff Nurse C, Salford.

‘I think the test of change work – I think that was a really good skill to gain in terms of doing small tests of change, because initially we wanted to change everything and that was a really good thing to use.’

Health care assistant C, Salford.

**Summit:** Nearly all respondent found the summit to be helpful as it helps to promote sharing of knowledge and success gained during the collaborative. Furthermore, the respondents felt that their work and success was acknowledged by others in the organisation.

‘I think it made you feel sort of - quite proud of what you had achieved and I think it was really good for everybody to share their experience. It was good that we had all done so well. I don’t know how I’d feel if one group hadn’t done as well, but it was definitely uplifting and I think it – you know – you wanted to do more, to carry on what you had done.’ Health care assistant C, Salford.

‘I thought that was one of the good things about the summit as well that there were lots of different people there that – you know there was lots of managers and consultants came and patient representatives to see what you’ve been doing. I thought that was good networking as well for future projects. We quite often get left in things like that so it was quite good for us to raise our profile as well.’ Dietician B, Salford.

A respondent felt that the presence of senior individuals from the Trust was nerve-wrecking, especially prior to their presentation.

‘The summit was nerve wrecking. It was ... the build up to it was very frightening because I had visions of being absolutely terrible, all the bosses there and ... the thing I must criticise other teams had too long talking, they had the hour which made me later, which made my adrenalin levels, stress levels, so high, I felt like if somebody had really pushed me I might have cried because I was so stressed. That was the
only criticism I had... ... It’s a relief to get it over and done with. Yeah, relief. But it was nice to have the feedback but I must admit.’ Staff Nurse C, Salford.

4.4.2.2 Data on Determinants of Success

The respondent’s opinion on determinants of success can be divided into internal and external factors to the improvement team.

The respondents identified project management skills, team composition and Looking at internal team factors, the respondents felt that their project management skills, teamwork and team composition were the factors that helped them through the collaborative work.

Project management skill of improvement team: The respondents acknowledged that the team failed to manage their improvement work in the beginning of the project.

‘I think good organisation within the team and actually deciding and knowing what we wanted to change and who needed to do it was most important and also I think it was good for us that we sought help to make that change; we couldn’t have done it on our own so that was sort of utilising the different people who were around was really useful. I think we did work well as a team – it was just, for us it was more the organisation side was lacking and getting people enthusiastic.’ Dietician B, Salford.

The team felt that a key factor that helped them to succeed was the acknowledgement of the importance of project management skill their improvement work. Key tasks such as organising team meetings and producing minutes of meeting that were perceived to be useful were delegated and structured according to their need.

‘One of the steps we took was to arrange a weekly meeting at a specific time. It was previously an ad hoc time when everyone had a free minute but that didn’t work so we set a set time for a Monday afternoon and also we set a structure to follow in terms of paper work with someone being the role of Chair and somebody making note of the action points to try and take things forward.’ Dietician A, Salford.

Teamwork: The respondents felt that teamwork is crucial to the success of the improvement work.

‘Teamwork was the key to achieving our success’ Health Care Assistant C, Salford.
The respondents said that teamwork constitute of how well the team works together and the individual relationship or dynamic in the improvement team. All of them felt that composition of the team plays an important part in improving the teamwork.

**Team composition:** Most respondent felt that the team should have individuals from different background in the team as each individual was able to bring their own experience and individual expertise to the project.

“We needed MDT (multidisciplinary team). We needed a dietician, dieticians can help in many different levels, not just for talking to patients. They have expertise, they do teaching packages. It’s also the way they held the group together as well, they came around, they sort of say hello and ask for an update, and get everyone together. They were the best people to actually run a meeting and actually give feedback and have the minutes produced. Sometimes the others asked me to do that but I can’t do it, yeah, I can’t run meeting or do minutes quickly.’ Staff Nurse C, Salford.

The respondents also felt that having individuals with different strengths and weaknesses directly helped to improve teamwork and ability to push changes through.

*I think we all work differently as well. We have all got different strengths and weaknesses. Some like to start something and see it through to the end and some have got really good ideas but they don’t quite know how to put them into practice if you know what I mean. So I think we’re all; we all work well but we all work quite differently sometimes which probably strengthens the team really, I think’ Health Care Assistant C, Salford.

There was an active effort to improve team consistency by identifying individual roles in teams and their key strengths that can be utilised. For example, Belbin inventory was performed during one of the learning sessions to help the team improve on the team consistency.

*It came across through the second learning session we had when we did the different questionnaire where we did the Belbin, so through that looking at the team we kind of got to see at the different role people got to play and it came out that the dieticians were good at managing and co-ordinating. We knew that we are good at that beforehand, but I suppose it didn’t become clear until we actually did the questionnaire and saw what everyone’s role was. It identified it in concrete writing, even when you actually know it yourself, it also defined everyone else role, it made it easier to label people, you do this, I do this, and hopefully we can get the job done.’ Dietician A, Salford.
The respondents identified one factor external to their team that can influence success.

**Support of project team:** The respondents felt that the support helped the team to overcome certain barriers and keep them motivated with the improvement work.

‘It managed to keep me motivated and second thing it’s always good to know that things are improving so it was more encouraging for us when you come out with “where are we now” and things are improving, getting better. That kind of kept us going and interested in the project.’ Doctor 1, Salford.

4.4.2.3 Data on Barriers of Collaborative

The respondents identified three barriers in form of inconsistent team, lack of time, lack of staff organisation of staff and lack of support from management that has hindered their success in the improvement work.

**Inconsistent team:** Respondents felt that their work suffered in the beginning because of the inconsistency in the team due to staff moving away. They felt that they achieved a lot more once they have the same staff working in the team.

‘Some of our members left as soon as the project started. So that led to a lot of like taking a step backwards. That’s probably why we didn’t achieve initially any improvements. But after that lucky, fortunate some members stayed together and we got through the project. That shows that consistency is matter’ Doctor 1, Salford.

**Lack of time:** Lack of time was cited as one of possible factors that have hindered the improvement work. There were two differing thoughts on why this occurs. The nurses argued that the lack of time is due to unpredictable events occurring in the unit, made worse by the lack of staff.

We’ve just not; we’ve just had lack of time. Sometimes you know, you anticipate meeting up and obviously discussing and then something will happen and something has to go somewhere and in a way, sometimes when you’re so busy on the unit, it just sort of takes a back seat.’ Health Care Assistant C, Salford.
The dieticians and doctor disagreed with this. They felt that the lack of time is due to the way the individuals in the team organise their workload and how well they use the time available.

‘I don’t think they manage their time well, I think there is a lots of lull period during dialysis, this is what I have observed when I was in the unit, there are lull periods when certain things can be done or opportunity for education are available but they didn’t seem to use it.’ Dietician B, Salford.

**Organisation of staff in the unit:** All respondents felt that the way the staff was organised in the unit was preventing them from performing any tests of change or making any headway in their improvement work. The way the staff was organised meant that they were not able to see the same patient or work with the same staff regularly. This was perceived to be the main stumbling block in the beginning of the project.

‘Well, right at the beginning the way the nursing was split in terms of the works between 2 units was a big problem which the QI team helped to sort out. Basically they negotiated with the ward manager to allow the consistency of nursing on the purple unit who were the member of the improvement team to do the improvement work. It caused problems because different patients were seen by different nursing staff. The nursing staff didn’t know what was going on – various new things have to happen which would have been difficult if the same staff weren’t seeing the same patients often enough’ Health Care Assistant C, Salford.

‘The way we work, you know, we never see the same patients You know, dividing the unit up. What you’re going to break down. So moving between the two areas wasn’t working, everybody knew it.’ Staff Nurse C, Salford.

**Lack of staff:** The respondent said that lack of staff in the unit affected their improvement work. It prevented them from performing tests of change, disrupted their meeting schedule and reduced their time that they can spend on the improvement work.

‘I think initially we had so many people who were on maternity leave and people were off unwell as well and now obviously, we have got a lot of those people back so it is making a difference.’ Health Care Assistant C, Salford.

One respondent said that the perceived lack of staff is mainly due to the way the staff was organised in the unit, rather than true shortage of staff.
'probably we have, as a unit, we may have enough staff but I think it’s the rota management that is not good. So it’s not utilising the staff members efficiently. So the rota needs to be organised more efficiently.’ Doctor 1, Salford.

**Lack of support from management and senior leadership:** All the respondents felt that they did not have enough support from the management and senior leadership during the improvement work. Lack of support leads to poor motivation and also prevented the right staff from getting involved in the work. Individuals in the team also said that they have had problems with attending learning sessions and did not receive any help from the management when they raised the matter.

‘Lack of support from manager is massive barrier. Well, it stops us doing the project really and getting the right staff involved, implementing any changes that we want to do, it is a big stumbling block. It absolutely effect staff attendance to meeting and learning session too. It is difficult for me to say because we don’t work in the unit. We tried to overcome it by getting support from project team and by trying to identify the influential people within the management and the unit and speaking to them to try to get them on board.’ Health Care Assistant C, Salford.

‘Our managers have not been supportive. Not L, not B, not the others. I mentioned it about to others because one of the things that J wanted me to do was make it more visible, show people, because once we started making the improvements, I had a word with the matron and she just grinned at me – she just nodded and grinned at me, because that was what J wanted me to do, speak to the matron, so I did. I didn’t get any help. B, it was sort of, “Yes, yes, yes.” And then on we go. H, didn’t come and find me.’ Staff Nurse C, Salford.

The doctor in the team raised a point that the manager in the unit tends to nominate unsuitable individuals to be in different projects, by using preferential treatment rather than merit.

‘My experience with person management, I’m not criticising anybody but always when we ask for some, the management to nominate a person to look after certain subjects, we always get the worse person. The thing is there are the talents in the unit but unfortunately they don’t get the deserved praise. My feeling is it depends on the management preference. So maybe management they want the good nurses to stay in the unit looking after the patients and the people who are not so well performing will be taken off, “oh, you do this work”. It’s the attitude of the management. So probably they don’t realise the importance of these projects.’ Doctor 1, Salford.
4.5 Transplant team

4.5.1 Data from Existing and Secondary Sources

The transplant team
Transplant provides out-patient pre- and post-transplant care to 400 patients across the renal network. The transplant team compromised of four specialist nurses and two staff nurses. They were managed by a senior specialist nurse who works with another team (Chronic Kidney Disease (CKD) team). The team was reorganised five months into the collaborative work when the team manager took up a temporary fellowship post where the one of the specialist nurses had to take up shared management role of both transplant and CKD team. They are supported by five renal consultants.
There was no turnover of staff in the team.

The improvement team
The transplant improvement team started with 3 specialist nurses in the team. A nurse left for maternity leave four months into the collaborative work.

Improvement team meetings
The team had a lot difficulty in arranging their weekly meetings which is reflected by the fact that all their meetings occurred only when the project team were there to facilitate the meeting.

Facilitation
Transplant team had 8 facilitative visits by the project team during the collaborative work.

Number of tests of change
The team performed 6 recorded tests of change during the collaborative work.

Outcome of improvement work
The transplant team were asked to improve cardiovascular care amongst their patient by ensuring 98% of transplanted patient completing a cardiovascular risk assessment annually.
The transplant team withdrew from the improvement work 6 months into the project.
4.5.2 Data from the Semi-structured Interview

4.5.2.1 Data on Elements of Collaborative

The respondents have limited exposure to the collaborative elements as the transplant team withdrew half-way through the improvement work. The respondents found that three elements of the BTS methodology were useful during the improvement work.

**Topic selection:** The respondents were critical on the topic given to them in the improvement work. Although the respondents felt the topic given was good, they found the topic was difficult to grasp and it didn’t suit their way of working. ‘And I think it’s difficult for us because we’re not clinically based, that it was always going to be something that we developed without an actual patient in front of us, so it wasn’t something physical that we could do, you know, doing the line or whatever, it wasn’t that and I think that made it more difficult, even though the concept was good.’ Specialist Nurse D, Transplant.

‘I think it was a good topic, whether it’s the right topic I don’t know, I think it was good, I think there’s maybe other things that we could look at as well, but I do think it was something that we weren’t interested in. I think we got confused and took it that we had to do everything ourselves and it really wasn’t about that, I don’t know, I think we took it all in the wrong context.’ Specialist Nurse C, Transplant.

‘I understood it, but I felt it was very difficult to apply for our group of patients. Because if, again they’re not clinical, we can do a test of change on someone’s line dressing or whatever because it’s there, it’s physical in front of you, because ours was all a bit virtual if you like, it made it more difficult’ Specialist Nurse C, Transplant.

**Expert faculty:** Both respondents found the framework was a useful guide during the initial stages of the collaborative work.

‘The diagram from the faculty was useful, yeah. I think we did use it a lot in the beginning.’ Specialist Nurse D, Transplant.

Despite this, the team did not use the framework by the faculty to ensure that they were on the right track especially when they were struggling with the work.

‘But we lost the focus because the focus was to give the cardiology review, which then came into a vision of just being all nurse led, by us - wrongly I feel, to improve on the anniversary review, which again was
partly because that’s an area that the transplant nurses personally wanted to improve.’ Specialist Nurse C, Transplant.

**Learning session**: Both respondents felt that the learning sessions were useful for the team. They felt that the sharing aspect of the sessions, particularly on barriers and solution, was a good way for them to learn on applying the same principles to their work.

*I think the learning systems helped, I think they were really good, ‘cause I think it was good to listen to what other areas are doing and their problems as well, I enjoyed those.* Specialist Nurse D, Transplant.

*I found useful hearing how the other teams had done stuff, you know, hearing how – what problems they’ve done and what they’d achieved from that. More about the failings really and how they could round them, and then showing their impressive results that they’d got as well which – I got a lot from that. I quite liked the interactive stuff but it was more hearing what the other teams were doing that I liked.* Specialist Nurse C, Transplant.

One respondent felt that whole day sessions can be difficult to attend and often the team can only come for half of the day due to other clinical commitments.

*‘Also the meetings that we did attend, although I appreciate – there was a lot of content. A full day away from your own work was hard, to get that, and most times I wasn’t able to manage that. I’d probably get there for half of the time, which then you missed out on half of it, which wasn’t – the bits I did go to were good, you got a lot from them but unfortunately you just couldn’t get there because of the clinics and other commitment.’* Specialist Nurse C, Transplant.

**Action Period**: Both respondents felt that email was a good way to communicate as they have good access to computer.

*‘Email is what I like. I like an email. I don’t have to read it there and then, I can click it, I can flick it up to read later, and I can do it when I have time, and I always liked the newsletters as well. I’d always read the newsletter, I liked to hear how – again, photos and such like. It was a useful.’* Specialist Nurse C, Transplant.

**Model for Improvement**: Both respondents found that the Model for Improvement was a useful method to try different way of doing things.
'I found the small test of change useful. I would definitely start it with more structure, have more embrace than little tests of change and I already use that in my own practice now, in things that I want to trial out. I like the QI approach really, I can see there is a lot of benefit from it.’ Specialist Nurse C, Transplant.

4.5.2.2 Data on Determinants of Success
Both respondents did not have any comments regarding determinants of success due to the team’s withdrawal from the collaborative.

4.5.2.3 Data on Barriers on Collaborative

Team composition: Both respondents said that the improvement team did not have the right individual in it to drive the work forward. This resulted in a lack of medical expertise which was a big obstacle for the team to be able to formulate the cardiovascular assessment bundle.

‘We weren’t getting the medical input for the cardiology, we got that initial stuff – it was above our heads to make those decisions about that cardiology stuff – I think because we just decided to lead with what we could lead with, and that’s why we never actually got to the QI bit that we should have. So the medical-side, again, we needed more support. The registrar never identified, never got on board. Consultant times were always very special – not special, what’s the word? – demanded.’ Specialist Nurse C, Transplant.

‘To do it, and I think that’s what we did with the ... how we ... I took the questionnaire to clinic with me and I did them all, but yeah really we could have got the doctors to do them as well, so it ... and I didn’t know what to do with them when we’d got it, that information, I didn’t know how that needed to be used.’ Specialist Nurse D, Transplant.

The team felt overwhelmed by the knowledge and expertise needed to continue on with the improvement work because of the poor team composition.

‘I think some of them, especially, because it is a small team, there’s J(team manager) who set it up, identified it, and said there was these two Band 6s that were doing the work. I think they felt they were quite overwhelmed really. It was a bit too much for them and they didn’t embrace it too well. So my reflection is probably that they needed to get on board a bit more and what we did was we made it all
about the nurses rather than – it was supposed to be a multi-disciplinary, and it should have been.

Specialist Nurse C, Transplant.

**Project management skill of improvement team:** Lack of project management and organisational skill in the improvement team was perceived to be a major issue by the respondents. They acknowledged that they were difficult to be project managed as a team.

*It’s the timeliness of it and getting stuff done by delegating it to the right person. What else? I think you’re probably – I think we were probably quite an unruly bush to rule, we didn’t manage our project well, and we probably need to be strict next time and use the tools there, because we didn’t always use what was there, we didn’t do it to the letter, at all’ Specialist Nurse C, Transplant.*

The respondent confirmed that basic project management tasks such as organising weekly meetings, executing agreed plan and conducting follow-up assessment were not performed.

*I think we’re probably a very hard difficult team to manage as a team. We don’t organise our meetings well. Sometimes we can be quite disruptive in the meeting, and also, we then tell people to do stuff but we might think “Oh, we’ll do it tomorrow, we’ll do it tomorrow” and unfortunately sometimes it never gets done. So we come to the next QI meeting and we haven’t actually done what we’d said we’d do at the last QI meeting. But again, we are a good team. You do – you are looking after patients, it is a clinical team, you prioritise your work and you think “I’ll do that next week” and– we never truly, completely tackled it.’ Specialist Nurse C, Transplant.

A respondent felt that their meetings should be arranged when all three team members were present as they fail to communicate effectively what decision made during the meetings to other individuals in the improvement team that could not make it.

*‘so I felt that on my days off there’d been a meeting, I came in after my day off and was told “Right, this is what we’ve got to do” and I didn’t understand it, I didn’t understand why we had to do that, what we were going to do with that. So I think maybe if everything could be changed, it should be that the people that are actually doing it, like I’ve said, should be there at every meeting and it be arranged around days off, which makes it very difficult unfortunately for our team because we all work part-time.’ Specialist Nurse D, Transplant.*

The respondents said that they tried to overcome this by identifying individual in the team that was able to act as a co-ordinator to help organise their work.
‘I think that’s the other thing we failed at. Yeah. It’s difficult because it’s such a small team and I’m not involved in that work which made it hard for me. But I don’t always know the complexities, which we said as team, you know, which is why we identified I could be the one to say “Right, we need the meeting” and actually tell them what they need to do. But that still didn’t always get done.’ Specialist Nurse C, Transplant.

**Lack of leadership of improvement team:** Respondents thought that the team lacked leadership and direction throughout the collaborative work.

‘We identified the problem, or what we wanted to improve and as we went along, we weren’t hitting the achievements we should have, we weren’t filling in the forms like we should have. We should have been a lot more structured I felt one of us should have led a bit better’. Specialist Nurse C, Transplant.

Lack of leadership prevented the team from making the right decision for their improvement work which stopped them from being able to get their work to the right direction. The team had pieces of puzzle together which wasn’t put in the right place as there was nobody in the team that was making the decision.

‘I think that we decided this is the way we want to run with it, so we decided we’d have to contact this person, that person, this person, and nothing gelled, nothing all went together. There was no leadership, no guidance, it’s almost as though you had all the jigsaw pieces, but just could not put them together, but you could see where they needed to go, but it just wasn’t going in that right direction. I don’t know whether that’s because we tried to involve too many people, we didn’t involve the right people, it just didn’t work somehow.’ Specialist Nurse D, Transplant.

‘We didn’t really get told yes it is the right way to go or it isn’t the right way to go. But then how much do ... should we be led? Should we not be leading it anyway? It’s difficult to find that balance of somebody saying “This is how you should do it” and us deciding how we should do it. But we took it on that we had to do everything and it really probably wasn’t about that and that’s why we failed.’ Specialist Nurse D, Transplant.

The respondents identified two factors identified external to their team that hindered their improvement work.
Respondents gave a different angle to another possible factor that hindered their improvement work. The respondents felt that their improvement work was used as a platform to drive other changes that the overall transplant team wanted to drive through, rather than concentrating on the changes needed to achieve their collaborative aim.

‘but we lost the focus because the focus was to give the cardiology review, which then came into a vision of just being all nurse led, by us - wrongly I feel, to improve on the anniversary review, which again was partly because that’s an area that the transplant nurses personally wanted to improve. It wasn’t working well and they’ve done a lot of work because of QI, it’s improved that anniversary review immensely. So it got led down the route, and we lost the focus of what we started because I wasn’t quite sure – I wasn’t completely clear at the beginning what that should be.’ Specialist Nurse C, Transplant.

‘Maybe, yeah, some of the work that we have done in the collaborative is because we were pushed to do it. Maybe some of the things that we needed to do weren’t the right thing, but some people thought it was, so we pushed ahead with that.’ Specialist Nurse D, Transplant.

Both respondents felt that they were poorly supported by their managers. The team was initially managed by a senior specialist nurse from a different team who wasn’t exposed to the quality improvement work.

‘Our management did not give much support. At that time it was H, who wasn’t involved in the QI for the CKD part so I don’t think they again appreciated what that involved, although they weren’t that involved in any of our management stuff there. So yeah there wasn’t any support above us, really.’ Specialist Nurse D, Transplant.

The reorganisation of the team management has its impact as it increased their workload. The team felt that the senior management should appreciate how much additional workload has been given to them and helped the team to cope with the workload. The additional workload, in form of additional management of another team, prevented them from concentrating on the improvement work.

‘I think the management’s a – the problem with the – the support we needed is the time, and fact is that when we started taking over an extra management role, that took over a considerable – it took over 50% of our working week I would say, managing this other team and still does. So for us to do our own work on top of our clinical work which hasn’t disappeared, and then to do extra was where we struggled. If there was management support there, yes that would help. I don’t know how we would have done –”
A respondent felt that the new team manager should have been more supportive by being more proactive in the improvement work.

‘I felt it needed a bit more direction from J. I mean, I could have been more of managerial – but she is the leader of the transplant team and intrinsically knows what that work entails and the pitfalls. But because she was the expert, she couldn’t – do you see what I mean? She needed to be more in the thick of it really. I think that was a problem as well. She would have really benefited from coming to the other meetings about the QI process as well and how, seeing how other teams are developing and you learn a lot in that.’ Specialist Nurse C, Transplant.
4.6 Wigan Renal Unit

4.6.1 Data from Existing and Secondary Sources

The unit
Wigan Renal unit provides out-patient haemodialysis service to an average of 52 patients and has 18 staffs working in the unit. They are supported by two renal consultants and two renal dieticians. The turnover of staff in the unit was around 11% during the collaborative year. The unit had an average of two vacancies throughout the year.

The improvement team
Wigan Renal Unit had a consistent team from the start of their improvement work. The improvement team consists of an administrator and two staff nurses.

Improvement team meetings
The improvement team met once every two to three weeks. The project team facilitated 22 meetings. Analysis of the minutes revealed that the team spent most time discussing how to perform tests of change and how to implement the changes.

Facilitation
Wigan renal unit had 22 facilitative visits by the project team during the 12 months of the collaborative work.

Number of tests of change
The team performed 38 recorded tests of change in variety of areas that includes staff education, patient education, adopting protocols and new techniques to line care.

Outcome of improvement work
Wigan renal unit was given an aim to improve dialysis adequacy by getting 90% of their patients to achieve a urea reduction ratio of more than 65%. In the beginning, 77.8% of their patients achieved the recommended clinical standard. By the end of the collaborative, the team made 21% improvement to their allocated clinical standard.
4.6.2 Data from Semi-structured Interview

4.6.2.1 Data on Elements of Collaborative.

The respondents found that three elements of the Breakthrough Series methodology were useful during the improvement work. These elements were learning sessions, Model for Improvement and summit. Some respondents found that certain aspect of the action period was not useful.

**Expert faculty:** A respondent felt that the framework compiled by the expert faculty was useful as a guide since the team has limited knowledge of how to get to the aim given to them.

‘Because if you don’t know much about what is supposed to be done with the project, then the expert’s framework needs to be followed and it has helped me to get interaction and get the people here to do test of change.’ Staff Nurse G, Wigan.
**Learning session:** All three respondents felt that the learning sessions were useful to help in their improvement work. The first learning session helped the team to be introduced to concept of quality improvement collaborative and enabled the teams to meet up.

*‘The first session was nice, you learnt what you’re supposed to do and how to get it along and we are meeting with other people who are doing it.’* Staff Nurse G, Wigan.

The sessions helped the team by providing them with new ideas and enabled them to compare their work with other teams in the collaborative.

*‘The learning session was useful, you can see what other units are up to, sometimes you might not be making as much progress as everybody else but then everybody gets together in the same room you can see that you are doing well, everybody is on track.’* Administrator 1, Wigan.

The staff works in a busy clinical environment which hard for the team to focus on the improvement work. The learning sessions helps to motivate and refocus the team to the work at hand by comparing and sharing their work with other teams.

*‘The learning sessions that the team have been able to get to, they come back and they’re re-motivated, re-energised and re-focused that little bit further. It’s hard working when all the balls are in the air, everybody’s asking for more and more with less and less time and less and less staffing. Going to a learning session, what that acted as was an impetus then for getting new, fresh ideas and coming back and exploring them in an environment that was safe, with me supporting what they wanted to achieve. That was definitely the strongest element, I think.’* Unit Manager B, Wigan.

The learning sessions provides a platform for the team to share their experiences relating to both collaborative and other general day-to-day work. The sessions also helped the teams to overcome barriers faced during the improvement work.

*‘We can feed information from each other on the things that we have done in the past, for example, the blood pressure protocol had helped Salford in the beginning. Contact that other units had, not necessarily relating directly to what our things are another example. Plus, if you are hitting a brick wall, you can speak to someone, and they can say yeah we had the same, don’t worry, you’ll get there in the end.’* Administrator 1, Wigan.

**Action Period:** The respondents vary on their opinion on the phone conferences that were set-up during the action period. The administrator felt reassured with the team’s progress after the phone conferences but felt that the team generally feel didn’t get much from the experience.
‘I didn’t think I got as much in the phone conference as a team, I thought in the beginning when that was, you know, planned, what can we get by speaking with other people over the phone. But it is just a bit of reassuring to speak to other people, and we came away with it with a few ideas. The main thing is that we got reassurance that everybody are struggling with different things, the same as us.’

Administrator 1, Wigan.

The staff nurse interviewed felt that the phone conferences were a better way to communicate as he found he could get information from other teams and he was unable to check his email regularly.

‘Phone conference was more useful than email. I don’t get to check my email often. The phone conference was more of the image because in a phone conference we will come to face to face with others and get what they’re bringing, how they’re doing it and all those things.’ Staff Nurse G, Wigan.

**Model for Improvement:** Respondents felt that the Model for Improvement was helpful concept to enable the team to plan, to test changes in an organised fashion and to learn from problems identified to help implement the necessary changes.

‘Because with test of change we need to plan and do it in a small way. We cannot do a large amount we need a few test of change and to know that if it will work and what are the shortcomings and what are the advantages of the changes. Knowing the shortcomings helps, then we can work on the shortcomings, then get the test of change and do it.’ Staff Nurse G, Wigan

The small tests of change have helped to change the way other staffs in Wigan look at changing practice. The rapid cycle of improvement that comes with successful tests of change made it easier for the team to introduce changes to practice with minimal resistance.

‘Make little changes, I think that was the big thing really, we didn’t go with all guns blazing, we gonna do this and this by the end of next week I think it was just the idea of starting of small you know making it big over time I think was one of the big thing that made it work. I think if we go in and make all the big changes, it would never got anywhere. Using the cycle works really well, that was also used to sell to staff why we are doing it. Say for example, we start with 5 patients, next week with 10, it doesn’t feel like you are making much change, but by the end of 8 weeks, all the patients are converted them into what you wanted them to convert to like saline circulation, you started off with 5, by the end of it, the girls introduced something new without knowing. It just happened, and that’s it.’ Administrator 1, Wigan.
**Summit:** The respondents felt that the summit was useful to celebrate the success gained by the teams. One respondent felt that more patients should be invited so that it is easier for them to continue with their improvement effort.

‘The summit was good. We learnt a lot from the other teams, some of their changes we will copy. It was nice to be appreciated by our managers, the collaborative certainly has done a lot of good in the department.’ Administrator 1, Wigan.

‘Summit was good especially getting the awards. The only one thing which I wanted is some, you know, of the patient should be also be there, so that’s only the main thing. Just a few more patients, just to get the patients also involved in this to know, to see what it is about and that stuff. It would help us, you know, when we continue our changes.’ Staff Nurse G, Wigan.

**4.6.2.2 Data on Determinants of Success**

The respondent’s opinion on determinants of success can be divided into internal and external factors to the improvement team.

The respondents identified team composition and leadership of improvement team as two factors that determine success of collaborative work.

**Team composition:** Respondents felt that the having the right staff in the team made the difference to the team. In addition, the team utilised unique skills brought by different individuals to help the improvement work.

‘Yes, definitely we need to select, I mean, get the right person to be involved. It made a difference to us, yes. E is good with computers, and C is good doing the leadership.’ Staff Nurse G, Wigan.

‘It’s good because like I say we have a member of staff sort of from each level of experience, obviously I am from admin background, I don’t know a thing about nursing, I probably can bring something to it from that, maybe other jobs people had from area of medicine, people can bring their experience.’ Administrator 1, Wigan.

**Leadership of team:** Respondents identified that leadership helped guide the team through different problems encountered and has driven the improvement work forward. Leadership comes from different individuals, rather than traditional hierarchy.
‘Leadership, of course is important, because sometimes it can give a proper guidance and you get together everybody to work together, it solves a lot of problems actually.’ Staff Nurse G, Wigan.

‘Leadership doesn’t just necessarily mean me and the doctors or me and the Band 6’s. We’ve got strong leadership coming through E and how she drives things forward. A, who’s changing roles, has changed roles twice while been here, his leadership is a different kind of leadership and that’s best supporting the junior nurses so then some of the things can be driven forward. So leadership doesn’t just come from the top.’ Unit Manager B, Wigan.

The respondents identified two factors external to the team that determined success of collaborative work.

**Staff engagement:** The respondents felt that good staff engagement has helped to get the staff in the unit to actively participate in their improvement work. The team engaged the staff in the unit using various ways, such as handing out minutes of meeting and organising education sessions. Staff engagement occurs to convey what the team learnt during meetings and to inform staff on the test of change that will be performed.

‘We see it as a unit work rather than these 4 people in the collaborative. The whole of the unit has had some sort of input, they might not been directly involved in the meeting but whenever we have been to a learning session or had a meeting, the minutes are feedback to the whole unit, not just the people in the collaborative. I think that is the main thing, everybody play a part in their own way.’ Administrator 1, Wigan.

‘For the test of change, we need to get the staff to be involved in it, the team has to work and educate them on what we doing and then ask what is their opinion. We can do a slight change in the action plan, actually, to help what we are going to do so we can get the full cooperation of the staff to do the test of change.’ Staff Nurse G, Wigan.

The team adopted an open attitude towards the other staff by consistently passing all their information to the rest of the unit. The team acknowledged that they needed the help of other staff in the unit to get their work going, rather than just relying on individuals in the improvement team.

‘Also the Collaborative, they don’t just look after themselves and not let anybody in. It’s open, it’s honest, it’s discussed and everybody has to be in it at some which way over, to a greater or lesser extent. So for the Collaborative, the Collaborative wouldn’t work if the support workers didn’t know that exercise was
very important to us. We need the machines up and running, ready and available. So they come up, even though they may be tired at the end of the week, coming up dead sprightly, loads of motivation for the patients to get on the exercise bike.’

**Support from management and senior leadership:** The respondents felt that the improvement work has been well supported by their managers.

‘The management was okay, fine, because the champions are there to breakdown barriers and motivate to get any depth of change, so management is not a problem at all.’ Staff Nurse G, Wigan.

Despite being in the collaborative, respondent perceived that permission was still needed to drive through changes. The unit manager support was deemed to be crucial to obtain the permission and to help push the changes to the forefront.

‘I think sometimes, there could be times, when you when you want to do something but can’t do it because you got to have somebody to give you the authority to do it, at the end of the day, it is about the patient. We got J (unit manager) on board in the beginning, she is proactive, it helps to get somebody like her, who wants to get the ball rolling, not to hang around, because really you could sit on something for months without doing anything. If you have somebody like J, who reasonably at the top, pushing it along it helps to move things along, especially in the NHS where things go a lot slower pace than anywhere else.’ Administrator 1, Wigan.

However, the unit manager was very supportive by making it clear that the team did not need permission to perform test of change during the collaborative period.

‘I think things were a bit shaky and they were not very confident in the beginning and they needed more input but certainly in the last couple of months they’ve needed less input and less probably permission. They didn’t need permission, they’re working through the Collaborative. Through respect they would talk to me about it anyway because we have that relationship but they’ve not needed my permission. They’ve just thought, “This is a good idea. We’ll talk through it with J then”.’ Unit Manager B, Wigan.

Interestingly, the unit manager did have reservation to some of the changes tested. Despite this, the unit manager supported the team’s work as it was felt that the collaborative provides a safe way to tests the changes.

‘And even though I might not always have agreed with what they wanted to run with at first, because it is a collaborative, it is to some extent in a controlled environment, trying different things in different ways, they’ve tried one way and it’s not quite worked. They’ve tried a different way, it’s worked better.'
The end goal is that pretty much what’s happening now is where I wanted it to be.’ Unit Manager B, Wigan.

The unit manager suggested that the improvement work had a lot of support from the Trust management as it is aligned to the Trust expectation of quality. This allowed them to push through some of the changes quickly.

‘The Trust do work at a very high level and they expect very high standards and we have to deliver that internally within the Directorate. The senior team was very supportive with our collaborative work, it really helps’ Unit Manager B, Wigan.

4.6.2.3 Data on Barriers on Collaborative

Respondents identified three barriers that have hindered their improvement work.

**Shortage of staff:** Staff shortage was an issue raised by the respondent that had a significant impact on their improvement work.

‘There are shortages of staff every day in each and every place, including Wigan. That is a real problem. It happens because of the sicknesses and if it happens elsewhere, suddenly they want some areas to be covered up, we have to cover them. Because of the short staff, because of the manpower, less manpower means we are not being able to work on other stuff.’ Staff Nurse G, Wigan.

**Shortage of time:** All respondents said that shortage of time was a major barrier encountered during the collaborative period. Lack of time put prevented staff to attend meetings and education sessions relating to the improvement work.

‘Yes, the time is a barrier, you get problems to educate the staff and attend the staff meetings, we need all the staff to come together sometimes to let them know about our work and it’s impossible.’ Staff Nurse G, Wigan.

‘I think time is a big barrier. For me doing the admin work it just my job, and that’s what I do everyday. But I know for some of the nurses, when they try to find the time to maybe sit down and have a meeting having time put to one side not clinical that was difficult at the start.’ Administrator 1, Wigan.

The respondents believed that the lack of they genuinely don’t have enough time in the day, as this was attributed to lack of staff in the unit.
‘We don’t have enough time in a day. Because of the skill mix, you know, the if we don’t have enough staff, so you need to know sometimes it’s difficult to get the time off to do things.’ Staff Nurse G, Wigan.

To overcome the shortage of time, individuals in the team have worked outside their contractual hours. The unit manager supports them by giving them the time back in the future.

‘I think it’s because of the commitment. I think it has to be commitment. I know for a fact ... commitment’s important so I know that both Kath, all the Collaborative members have put extra time in excess of their contractual hours and I know that because ... but I expect that they’ll get it back when they can. So we have the time owing book which causes quite a bit of concern around the Directorate but that’s in honesty and trust which I’ve already spoken about. So if A’s done an eight hour piece of work at home and he comes and tells me that, he’ll say, “J, don’t give me eight hours, don’t give me eight hours” and I’ll say, “Well what are you asking?” And he’ll say, “Four, because I’m learning.” So in his head, in his learning head he gives himself learning time to become a better practitioner and then it’s about meeting half way and I think not all areas work like that.’ Unit Manager B, Wigan

Finance: One respondent felt that process of obtaining the necessary fund to buy equipment was tedious and slowed down their improvement project to a degree, although the team did not have any problem in obtaining the fund.

‘Sometimes if you needing something, like the exercise bike, you needing actually money to buy things that going to improve project, I think we find it time consuming. We have to request it at this place, and then you got to order it, then you need to get an order number, it’s got to go to another department, then go to get it sign off. In the end it took a few months to get it, it just delays it. In it’s frustrating, you got the patients who really want to use it. That’s not been a big issue, not an issue but one of those things that takes a bit of time really.’ Administrator 1, Wigan.
4.7 Cross-case Trends Analysis

Cross-case trend analysis summarise the findings obtained from all the teams during this research. This summary is useful to guide the discussion in the next chapter by comparing the findings with what has been noted in the literature on this particular research topic.

The cross-case trend analysis will also be used to help to formulate conclusion of this study by helping to identify the recurring themes found in this research which will be used to put together suggestions for future research and future collaborative work.

4.7.1 Data on Elements of Collaborative

Table 7 below provides a summary of respondent's opinion on how the collaborative elements help the teams during the improvement work. This section will go through the table by looking at each of the eight collaborative elements from topic selection to measurements and how it was seen by the participants.

The cross-case analysis revealed that despite working on five separate topics in a modified collaborative, only respondents from transplant team have commented on topic selection, where they felt that the topic given was inappropriate for the team. The team had difficulty working in the improvement collaborative from the beginning as the topic given was felt by them to be inappropriate and not to be of clinical benefit.

Some of the respondents in the research felt that the expert faculty was a good source of information. The respondents felt that framework provided by the expert faculty was useful as a guide in absence of in-depth knowledge in the frontline improvement team. The expert faculty was also seen to provide an impetus for change during the improvement work by providing a real-life example of successful service delivery. Although some of the respondents felt that the improvement framework was useful, there were also respondents who haven’t looked at the framework provided by the faculty and who only used it to justify changes that they already wanted to make.

All the respondents acknowledged that the learning sessions were crucial in helping them in the improvement work. The learning sessions helped the team not only to learn about quality improvement skills and technique, but more importantly it provided a platform for the teams to learn from each other
and share their experiences during the improvement work. It also helped the teams to obtain new ideas for improvement and how to implement it. The exchange of ideas and experiences were consistently felt by all respondents to be the most useful feature of a collaborative.

The respondents felt that the Model for Improvement, specifically the PDSA cycle, helped to make their work more manageable. The model is felt to be a good way to start their improvement work and it provides a realistic way for the teams to push through changes necessary for their improvement work. Most frontline staff felt that the model provide a simpler alternative to traditional way of introducing change by helping them to break the improvement work into small pieces that is easier to handle. In addition, the model helped them to learn about implementing changes and utilise new knowledge learnt during the learning sessions.

Only one respondent mentioned the collaborative website and none of the respondents in the study have accessed the website during the improvement work. The teams felt that the action period was useful as it provides the team with time to perform necessary test of change. There was a conflicting response on how best to communicate during the action period. Staff nurses and healthcare support workers working in the frontline feels that visit by the improvement team was more useful and they felt that emails were not a good way to communicate. All the respondents were unequivocal in stating that phone and web conference were not useful in this collaborative. Respondents felt that his was due to poor use of technology and their perceived need to have a face-to-face discussion.

Respondents from all the teams felt that the summit was helpful as it was a good way for the team to celebrate success and made the respondent’s felt more valued. Some of the respondents felt that the summit provided them with the opportunity to share the learning made during the improvement work.

No respondents commented on measurement element.

Table 8 next page summarises the respondent’s opinion on the collaborative elements.
<table>
<thead>
<tr>
<th>Topic Selection</th>
<th>Expert Faculty</th>
<th>Enrolment of Teams</th>
<th>Learning Session</th>
<th>Action Period Model for Improvement</th>
<th>Model for Improvement</th>
<th>Summit</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff Nurse A, Bolton</td>
<td>- Good source of information</td>
<td>-</td>
<td>-</td>
<td>Email good way to communicate</td>
<td>Makes changes more manageable</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Framework not regularly used</td>
<td></td>
<td></td>
<td>Phone/web conference not useful.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Care Assistant A, Bolton</td>
<td>-</td>
<td>-</td>
<td>Crucial for success - learning from other teams</td>
<td>Email good way to communicate Phone/web conference not useful.</td>
<td>Good way to start improvement work</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Unit Manager A, Bolton</td>
<td>- Helped to create impetus for change</td>
<td>-</td>
<td>Provides platform for learning &amp; sharing Staff improve communication</td>
<td>-</td>
<td>Helps to push changes through the unit</td>
<td>Good to spread learning &amp; enjoy success</td>
<td>-</td>
</tr>
<tr>
<td>Specialist Nurse A, Community</td>
<td>- Framework guides the team</td>
<td>-</td>
<td>-</td>
<td>Email good way to communicate Phone/web conference not useful.</td>
<td>Makes changes more manageable</td>
<td>Good way to celebrate success</td>
<td>-</td>
</tr>
</tbody>
</table>
## Table 8. Summary of Opinion of Collaborative Elements

<table>
<thead>
<tr>
<th>Topic Selection</th>
<th>Expert Faculty</th>
<th>Enrolment of Teams</th>
<th>Learning Session</th>
<th>Action Period</th>
<th>Model for Improvement</th>
<th>Summit</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Care Assistant B, Community</td>
<td>-</td>
<td>Framework provides systematic guide to improve</td>
<td>-</td>
<td>Crucial for success – learning from other teams</td>
<td>Email good way to communicate Phone/web conference not useful.</td>
<td>Good way to start improvement work</td>
<td>Good way to celebrate success</td>
</tr>
<tr>
<td>Staff Nurse C, Salford</td>
<td>-</td>
<td>Only refer to framework to justify action</td>
<td>-</td>
<td>Useful for learning &amp; getting ideas</td>
<td>Cannot access Email &amp; Phone/web not useful. Facilitation helps a lot</td>
<td>Makes changes more manageable</td>
<td>‘Nerve-racking’ &amp; stressful</td>
</tr>
<tr>
<td>Health Care Assistant C, Salford</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Useful for learning &amp; getting ideas</td>
<td>Cannot access email Phone/web not useful</td>
<td>Help to push ideas within realistic time frame</td>
<td>Proud with achievement and work</td>
</tr>
<tr>
<td>Dietician A, Salford</td>
<td>-</td>
<td>Helpful but rarely used</td>
<td>-</td>
<td>Useful to help plan work</td>
<td>Didn’t get a lot from Phone/web</td>
<td>Changed mindset from wanting to change everything</td>
<td>Good to be invited to join on celebration</td>
</tr>
<tr>
<td>Dietician B, Salford</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Motivates the team</td>
<td>Ashamed during Phone/web</td>
<td>Easier to push changes</td>
<td>Feel work appreciated</td>
</tr>
<tr>
<td>Topic Selection</td>
<td>Expert Faculty</td>
<td>Enrolment of Teams</td>
<td>Learning Session</td>
<td>Action Period Model for Improvement</td>
<td>Model for Summit Measurement</td>
<td>Measurement</td>
<td></td>
</tr>
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<td></td>
</tr>
<tr>
<td>Doctor1, Salford</td>
<td>-</td>
<td>Never seen framework</td>
<td>-</td>
<td>Learn new skills and technique</td>
<td>Email was useful Facilitation motivating</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Specialist Nurse C, Transplant</td>
<td>Topic given is inappropriate</td>
<td>-</td>
<td>-</td>
<td>Sharing barriers and failures with other teams Difficult to attend whole day session</td>
<td>Email good way to communicate</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Specialist Nurse D, Transplant</td>
<td>Difficult concept to appreciate</td>
<td>Framework useful to guide in absence of knowledge</td>
<td>-</td>
<td>Sharing and learning with teams</td>
<td>Email good way to communicate Model helps learning and identify shortcoming</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Administrator 1, Wigan</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Compare progress with other teams</td>
<td>Email good way to communicate Phone/web not useful. Helps to change practice and push changes through the unit</td>
<td>Good way to share learning</td>
<td>-</td>
</tr>
<tr>
<td>Topic Selection</td>
<td>Expert Faculty</td>
<td>Enrolment of Teams</td>
<td>Learning Session</td>
<td>Action Period</td>
<td>Model for Improvement</td>
<td>Summit</td>
<td>Measurement</td>
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</tr>
<tr>
<td>Staff Nurse D, Wigan</td>
<td>-</td>
<td>Framework useful to guide in absence of knowledge</td>
<td>-</td>
<td>Meeting and learning from others</td>
<td>Email good way to communicate</td>
<td>Model helps learning and identify shortcoming</td>
<td>Success and hard work appreciated</td>
</tr>
<tr>
<td>Unit Manager B, Wigan</td>
<td>-</td>
<td>-</td>
<td>Re-energise and re-focus team</td>
<td>-</td>
<td>Makes changes more manageable</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
4.7.2 Data on Determinants of Success

The cross-case analysis has identified a number of determinants of success that were common across the respondents. Table 8 summarise these determinants of success according to each participants in this research. These determinants of success are divided into internal and external factors to the improvement teams.

Nearly all of the respondents in this study felt that team composition was important to success of the collaborative work. The frontline staffs felt that the right individual with the right skill such as subject expert and team leader was necessary to enable the teams to run effectively. Some of the respondents felt that teamwork was crucial to success but they agreed that it was more linked to team composition and having the right skill. Despite working in a dynamic workplace, most of the respondents felt that the teams need to be more consistent throughout the collaborative work to help them obtain their improvement goals. Staff felt that having the same individuals within the individual teams throughout the collaborative year helps to motivate the teams and preserve any knowledge gained during the improvement process.

Respondents from three teams felt that good project management was necessary to enable the teams to be able to perform necessary changes for the improvement work. Project management skills enabled the team to organise themselves to complete key tasks within a busy clinical environment. The respondents felt that the teaching given on project management during the learning session helped them to obtain the skill for this.

Respondents from Bolton, Community and Wigan felt that support by senior leadership and good staff engagement was important factor to success of collaborative work. The teams felt that good support from senior leadership helped them to obtain necessary resources and overcome barriers faced during the collaborative work. Furthermore, good frontline staff engagement was seen as a crucial determinant of success as it helped to spread the burden of work from the improvement team to the other staff in the participating areas. The teams felt that being able to spread the work to other staff was necessary as it reduced the amount of work needed to introduce and fix changes necessary for improvement. Good staff engagement can also help to the teams to push changes through easier as staff better understand the need for the changes to be made.
4.7.3 Data on Barriers on Collaborative

The cross case analysis has revealed a number of barriers faced by the improvement teams during this collaborative. Table 8 summarises the respondent’s opinion on the barriers to the improvement work, which is divided into internal and external to the improvement teams.

Time constraint was a common barrier faced by all the teams. Time constraint prevents the team from completing tasks relating to improvement work such as completing tests of change and obtaining measurement to assess improvement after change. Lack of time also prevents the team from being able to engage other frontline staffs working in their area. The teams felt that this resulted in more work for them as they were unable to pass some of the necessary work to other staffs. The respondents felt that the lack of time relates to organisational factors such as inadequate staffing level in the areas, poor rota or work organisation of staff within their clinical areas and due to unpredictable clinical events occurring during their shifts.

Another common issue across the teams was poor support from management and senior leadership. Respondents from two teams felt that poor support from senior leadership and management affected their work as they were not given the appropriate time and human resources necessary to conduct their work. Respondents felt that this made their improvement work more difficult to do as the participants were unable to complete simple tasks such as attending team meetings and communicating with other staffs.

Participants from two teams felt that finance related to the project was a hindrance to their work. The lack of finance slowed some of the changes that the teams wanted to introduce, in particular ones requiring acquisition of new equipments or items. However, the respondents felt that the lack of finance did not stop them from achieving their improvement aims.

Table 9 in the next page summarises the recurring determinants of success and barriers to collaborative work that was identified in this research.
Table 9. **Determinants of Success and Barriers to Collaborative Work**

<table>
<thead>
<tr>
<th></th>
<th>Internal Determinants of Success</th>
<th>External Determinants of Success</th>
<th>Internal Barrier</th>
<th>External Barrier</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Staff Nurse A, Bolton</strong></td>
<td>Composition of team</td>
<td>Staff engagement within unit</td>
<td>-</td>
<td>Finance relating to project</td>
</tr>
<tr>
<td></td>
<td>Consistency of team</td>
<td>Support from management</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Health Care Assistant A, Bolton</strong></td>
<td>Leadership of team</td>
<td>Staff engagement within unit</td>
<td>-</td>
<td>Finance relating to project</td>
</tr>
<tr>
<td></td>
<td>Composition of team</td>
<td>Support from management</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Unit Manager A, Bolton</strong></td>
<td>Leadership of team</td>
<td>Staff engagement within unit</td>
<td>Quality improvement skill</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Composition of team</td>
<td>Support from management</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Consistency of team</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Project management skill in the team</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Specialist Nurse A, Community</strong></td>
<td>Composition of team</td>
<td>Staff engagement within unit</td>
<td>Time constraint</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Consistency of team</td>
<td>Support from management</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Leadership of team</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Project management skill in the team</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Health Care Assistant B, Community</strong></td>
<td>Composition of team</td>
<td>Staff engagement within unit</td>
<td>Time constraint</td>
<td>Permission to access IT</td>
</tr>
<tr>
<td></td>
<td>Consistency of team</td>
<td>Support from management</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Leadership of team</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Project management skill in the team</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 9. **Determinants of Success and Barriers to Collaborative Work**

<table>
<thead>
<tr>
<th>Position</th>
<th>Internal Determinants of Success</th>
<th>External Determinants of Success</th>
<th>Internal Barrier</th>
<th>External Barrier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff Nurse C, Salford</td>
<td>Teamwork</td>
<td>Support from project team</td>
<td>Inconsistent team during the year</td>
<td>Organisation of staff in unit</td>
</tr>
<tr>
<td></td>
<td>Composition of team</td>
<td></td>
<td>Time constraint</td>
<td>Support from management</td>
</tr>
<tr>
<td></td>
<td>Consistency of team</td>
<td></td>
<td></td>
<td>Lack of staff</td>
</tr>
<tr>
<td></td>
<td>Project management skill in the team</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Care Assistant C, Salford</td>
<td>Teamwork</td>
<td>-</td>
<td>Inconsistent team during the year</td>
<td>Organisation of staff in unit</td>
</tr>
<tr>
<td></td>
<td>Composition of team</td>
<td></td>
<td>Time constraint</td>
<td>Support from management</td>
</tr>
<tr>
<td></td>
<td>Consistency of team</td>
<td></td>
<td></td>
<td>Lack of staff</td>
</tr>
<tr>
<td>Dietician A, Salford</td>
<td>Composition of team</td>
<td>Support given by central project team</td>
<td>Inconsistent team during the year</td>
<td>Organisation of staff in unit</td>
</tr>
<tr>
<td></td>
<td>Consistency of team</td>
<td></td>
<td>Time constraint</td>
<td>Support from management</td>
</tr>
<tr>
<td></td>
<td>Project management skill in the team</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dietician B, Salford</td>
<td>Composition of team</td>
<td>-</td>
<td>Inconsistent team during the year</td>
<td>Organisation of staff in unit</td>
</tr>
<tr>
<td></td>
<td>Consistency of team</td>
<td></td>
<td>Time constraint</td>
<td>Support from management</td>
</tr>
<tr>
<td></td>
<td>Project management skill in the team</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctor 1, Salford</td>
<td>-</td>
<td>Support given by central project team</td>
<td>Inconsistent team during the year</td>
<td>Organisation of staff in unit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Support from management</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lack of staff in the unit</td>
</tr>
<tr>
<td></td>
<td>Internal Determinants of Success</td>
<td>External Determinants of Success</td>
<td>Internal Barrier</td>
<td>External Barrier</td>
</tr>
<tr>
<td>------------------------------------------------------------------</td>
<td>----------------------------------</td>
<td>----------------------------------</td>
<td>-------------------------------------------------------</td>
<td>-------------------------------------------------------</td>
</tr>
<tr>
<td>Specialist Nurse C, Transplant</td>
<td>-</td>
<td>-</td>
<td>Poor team composition</td>
<td>Work hijacked by other agenda</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Project management skill</td>
<td>Poor support from management</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lack of leadership</td>
<td></td>
</tr>
<tr>
<td>Specialist Nurse D, Transplant</td>
<td>-</td>
<td>-</td>
<td>Poor team composition</td>
<td>Work hijacked by other agenda</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Project management skill</td>
<td>Poor support from management</td>
</tr>
<tr>
<td>Administrator 1, Wigan</td>
<td>Composition of team</td>
<td>Staff engagement</td>
<td>Time constraint</td>
<td>Shortage of staff in the unit</td>
</tr>
<tr>
<td></td>
<td>Consistency of team</td>
<td>Support from management</td>
<td></td>
<td>Finance related to project</td>
</tr>
<tr>
<td>Staff Nurse D, Wigan</td>
<td>Composition of team</td>
<td>Staff engagement</td>
<td>Time constraint</td>
<td>Shortage of staff in the unit</td>
</tr>
<tr>
<td></td>
<td>Consistency of team</td>
<td>Support from management</td>
<td></td>
<td>Finance related to project</td>
</tr>
<tr>
<td>Unit Manager B, Wigan</td>
<td>Composition of team</td>
<td>Staff engagement</td>
<td>Time constraint</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Leadership of the team</td>
<td>Support from management</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Chapter 5: Discussion

5.1 Introduction
The overarching aim of the research is to understand ‘How has the quality improvement collaborative approach been used by Salford Renal Network to implement changes and improve its services?’ This research was set to answer three questions relating to the overarching aim:

1. How do the elements in the collaborative help the teams in the collaborative to achieve their improvement aims?
2. What are the key determinants that can influence the success of this quality improvement collaborative?
3. What are the barriers encountered during the collaborative work and how did the teams overcome the barriers?

In particular, this research concentrated on obtaining frontline staff view on these three research questions.

The discussion chapter aims to discuss the findings in this study, to explore how they relate to the research questions and to compare them with current available research as discussed in the literature review chapter. The comparison will improve understanding of quality improvement collaboratives by reinforcing what is already known in this particular subject area and discussing new findings that were uncovered in this research.

This chapter will follow the same structure as the literature review: it will first discuss elements of the collaborative and how it helps the improvement work. This will be followed by discussion on key critical factors determining success and finally looking at barriers to the collaborative work.

5.2 Elements of the Quality Improvement Collaborative

Four publications have contributed to the understanding of how specific elements of a collaborative can influence the quality improvement work undertaken by highlighting different issues relating to the specific elements of the collaborative (Kilo, 1998; Øvretveit, et al., 2002; Wilson, Berwick and Cleary, 2003; Nembhard, 2009).
The studies commented that right topic selection is essential to drive change during the collaborative work. The right topic must be able to eliminate the gap between knowledge and practice, with a high-level performance available to learn from, and it has to be strategically important for the organisation (Kilo, 1998; Øvretveit, et al., 2002; Wilson, Berwick and Cleary, 2003).

The Collaborative in Kidney Replacement Therapy was unique as each participating team has their own topic to improve, resulting in the collaborative working on five different topics. Topics were allocated to each team by the central project team and agreed by the expert faculty. Despite this, only respondents from the transplant team discussed topic selection where the respondents felt that they were given an inappropriate topic to work on. The topic was inappropriate because the team felt that the topic did not directly influence patient care and the changes required did not directly involve patient contact. For example, staffs were required to go through electronic patient records rather than talking to patients directly in order to complete the cardiovascular assessment bundle. Being able to be directly involved in patient care motivates clinical staff to change and improve. In this case, inappropriate topic selection took away the motivation, which was likely to be one reason why the team failed to continue in the collaborative work.

The transplant team had to work on an innovative topic, which may be another reason why the topic was inappropriate for a collaborative. Creating an innovative assessment tool means that the team was unable to find an example of high performance for them to compare with and learn from. The quality improvement collaborative was designed to bridge the gap between poor and strong performers, and it was not intended to be a medium for innovation.

The literature suggests that the expert faculty should be made up of credible subject-matter and application experts to formulate guidance or evidence-based changes for the improvement team to follow (Øvretveit, et al., 2002). In this research, the expert faculty has helped to create the impetus of change in this project by showing real-life examples of high performance in a renal service. It appears that in this collaborative, the expert faculty was used to guide the teams on the way to achieve the changes, rather than using the changes themselves as guidance. This is different from the literature. If the expert faculty had not been part of a high-performing team elsewhere in the United Kingdom, this benefit may not have been achieved. Therefore, a collaborative can improve credibility and usefulness
of the expert faculty by including a subject matter expert that has been part of a high-performing team in the particular topic.

Learning sessions are a fundamental element in a quality improvement collaborative as they help the teams to acquire general and implementation knowledge (Nembhard, 2009). The literature suggests that the learning sessions need to help develop basic competence in quality improvement methods and change concepts to help the team commence their work (Wilson, Berwick and Cleary, 2003). The sessions should also emphasise learning and sharing as this can help participants to adopt different ideas to their local organisation (Øvretveit, et al., 2002). This research echoes the findings in the literature as all the respondents felt that the sessions were paramount to the collaborative work by improving their general and implementation knowledge. All the participants agree that learning and sharing their experiences was the most useful way to help adopt different ideas to their own area. It also helped to re-energise and re-focus the teams by enabling the participants to compare their progress with each other. In this collaborative, the project team understood that each staff has different learning styles to others. Therefore, the learning sessions delivered their training content using various teaching methods. This research found that some participants valued the didactic lectures provided; some found the team games useful, whilst others found small group exercises more useful.

During the action period, the monthly conference call, team-initiated phone calls and web discussions were three helpful media to improve general and implementation knowledge amongst collaborative participants (Nembhard, 2009). In this research, the participants did not appreciate the use of phone and web conferences during the action period. The reluctance to use these methods was due to technological and human factors: the participants felt that the quality of technology for the sessions was poor and made it difficult for the teams to participate. The poor technology might be due to inadequate resources given to the collaborative as the team had to use whatever technology they had in their areas rather than being given technology that was tailor-made for the task. The other reason for the reluctance was that the participants felt more comfortable with a face-to-face discussion rather than talking via the phone or computer. This might be due to the fact that this research interviewed frontline staffs who have never used this method of communication as they never need to use it in their day-to-day work. Another interesting finding was that the frontline staff working in the dialysis units felt that communicating using email is not useful as they cannot access the IT system frequently enough. This
might be due to the way the staff was organised in the dialysis units as they did not have time to check their email during their shift; the frontline staff’s time was used mainly to provide dialysis care, and no administration time was given to enable them to check their emails. This research suggests that a collaborative should tailor the medium used for learning and communication to the teams participating in the collaborative, rather than using innovative tools that participants have little knowledge of and limited access to.

The Model for Improvement is a pragmatic way for the participants to facilitate change, and the small tests of change enable participants to conduct any alteration safely (Kilo, 1998). In addition, the model improves implementation knowledge as it enables staff to feedback their opinions on the changes performed (Nembhard, 2009). This research agrees with the literature in that the Model for Improvement enabled participants in the collaborative to make changes more manageable and realistic. The model also helped participants to improve their implementation knowledge by learning from the success or obstacles to changes introduced. The way of implementing change was contrary to how the participants used to work; prior to this, changes were performed rapidly at the request of management on a large scale without any scope for review, which makes the changes unmanageable and prevents learning.

The literature has not commented on the summit despite being one of the elements described in the Breakthrough Series methodology. The reason for this is unclear, but it might relate to when the research was conducted as the summit tends to be the final event for a collaborative. For example, some studies conducted interviews with participants before completion of their collaboratives (Wilson, Berwick and Cleary, 2003; Nembhard, 2009). In this research, the respondents felt that the summit helped to acknowledge the hard work done by participants and allowed them to celebrate the success achieved with senior leaders and other staff in the renal network. The respondents acknowledged that this was important as it helped to boost team morale and motivate them to continue with their improvement work.

In this research there were two elements of the collaborative which the respondents did not comment on but the literature has commented: The first element was enrolment of teams where none of the respondents did not make any comment on the particular element. This was likely due to the method of
this research where improvement teams were interviewed instead of the central project team, as only the latter was involved in the enrolment of teams.

The literature suggests that participating teams should be encouraged to own their measurements and be trained to handle their own data (Øvretveit, et al., 2002) as rigorous use of measurement can help to accelerate improvement in the collaborative methodology (Kilo, 1998). Despite this, the next element that the respondents in this study did not make any comments on was the element of measurement. This might be due to the decision made in the beginning of this collaborative for the central project team to collate the main measurements relating to the first phase of improvement work. This decision was taken to allow the improvement teams to concentrate on learning how to manage change, perform tests of change and learn from the implementation process. The project team has planned for measurement to be handed over to the teams in the second phase of the improvement work.

Table 10 in the next page summarises the findings of this research when compared to comments made by the literature.
Table 10. **Summary of Findings of this Research Compared to Literature**

<table>
<thead>
<tr>
<th>BTS Collaborative elements</th>
<th>Authors</th>
<th>What the literature says on influence success</th>
<th>Findings in this research</th>
</tr>
</thead>
</table>
• Topic must eliminate between knowledge and practice to improve care  
• Example of high-level performance should be available in topic  
• Strategically important with potential financial savings  
• Broad topic leads to better innovation but specific topic more feasible for rapid improvement | • Topic given was difficult to understand and work on |
| **Expert faculty**         | Øvretveit, et. al. (2002) Nembhard (2009) | • Expert faculty member needs to be credible in the eyes of participants  
• Subject experts provides evidence-based changes for participants  
• Measurable and achievable targets set by faculty to team  
• Faculty as a source of information | • Framework provided helps to guide systematically  
• Guidance useful in absence of knowledge  
• Expert faculty helped to create inertia for change |
• Each team needs clear definition of roles and expectations  
• Continuous team forming and building before and during should be expected during collaborative | • All participants volunteered to be in improvement teams  
• Continuous team forming and building with help from project team |
• Develop team competence in quality methods and change concept so that they can be adopted locally  
• Equip team to deal with data and change  
• Learn and plan to spread and sustain improvement  
• Emphasise on learning and sharing with other teams is more useful | • Sharing and learning with other participants improve general and implementation knowledge  
• Helps to compare progress with other participants  
• Re-energise and re-focus team  
• Learn new skills and technique |
| Action period | Nembhard (2009) | • Monthly conference call and web discussion useful for learning  
• Application of model for improvement to allow small changes | • Phone & web conference not useful  
• Different staff prefers different communication method |
| Facilitation & contact | | | • Facilitation adequate and crucial for success |
| Model for Improvement | Kilo (1998) Nembhard (2009) | • Model is a pragmatic way to facilitate change  
• Small tests of change provides a safety net to learn  
• Model helpful to improve implementation knowledge | • Model makes changes more manageable  
• Helps to improve implementation knowledge |
| Summit & Publication | | | • Good way to celebrate success and spread improvement work  
• Success and hard work appreciated thereby improving morale |
• Ownership of measurement by individual teams | |
5.3 Key Determinants of Success in the Quality Improvement Collaborative

The Health Foundation report on collaboratives provides a comprehensive review of the literature on determinants of the success of a quality improvement collaborative (Hulscher, Schouten and Grol 2009). In addition, four other studies looking at determinants of success were also identified (Meredith, et al., 2006; Newton, et al., 2007; Nembhard, 2009; Lemay, et al., 2010).

There were a number of recurring determinants of success found in this study, which can be divided into internal and external determinants to the improvement team. Internally, the determinants of success identified by the research were teamwork, team composition, team consistency, leadership of the improvement team and project management skills within the team.

The literature suggests that there should be enough participating teams from multiple organisations to create a critical mass for change (Plsek, 1997; Kilo, 1998; Kilo, 1999). The teams should be composed of multidisciplinary participants, preferably including a physician to help improve communication and solve problems relating to implementation (Wilson, Berwick and Cleary, 2003). The team should also include a person who can be a system leader, a technical expert (or clinician), a quality specialist and a day-to-day leader (Kilo, 1998; Øvretveit, et al., 2002). In this collaborative, the improvement teams consist of a mix of individuals who volunteered and were selected by their respective unit managers. To ensure the teams have appropriate composition, participants were asked to review their team composition during each learning session. In this research, the respondents felt that team composition was crucial to the success of their improvement work and some of the teams changed the composition of their team to suit their work. The respondents felt that a multidisciplinary improvement team was crucial as it provided the team with the right skills mix to drive their improvement work. The central project team actively asked the teams working in certain topics, such as improving blood pressure and improving line infection, to recruit subject experts such as a physician or a dietician to their improvement teams. This move was based on the project team’s previous experience of working to improve these indicators. The inclusion of an appropriate subject expert in certain topics that required their expertise was seen by respondents as crucial to their success.
A review of studies relating to contextual factors suggests that team leadership can influence collaborative improvement work (Kaplan, et al., 2010). A change of improvement team leader appears to be a predictor of whether a team will drop out during a collaborative (Øvretveit, et al., 2002). In this research, the respondents felt that good frontline leadership of the improvement team helped them to be better organised and focussed on their work. Observation of the improvement teams revealed that leadership was non-hierarchal in nature, where in some teams junior nurses or administrators acted as team leaders rather than more senior nurses. None of the teams identified their leaders when they first met in the initial learning session; rather the teams used the Belbin inventory to identify an individual for the ‘co-ordinator’ team role (Belbin, 1981). These individuals were appointed to become team leaders and the unit managers and central project team helped them to develop into their role.

The literature suggests that the composition of improvement teams tends to change and a collaborative should be prepared to continuously build and form the teams (Øvretveit, et al., 2002). In this research, participants believed that having a consistent team was an important determinant to success. In this collaborative, the improvement teams which were faced with frequent changes to the composition of their team struggled with their improvement work and were slow to adopt changes to their practice. The frequent changes to the composition of their teams reflect the staff turnover and staff stability within their own individual area. Analysing the context of participating organisations might be useful to prepare for potential changes to the improvement teams.

The literature suggests that training on improvement technique, data collection and measurement should be provided to the participating teams to help them to reach their aim (Plsek, 1997; Øvretveit, et al., 2002; Ayers, et al., 2005). However, the literature did not suggest training on project management during the collaborative improvement work. Project management has been extensively used in the healthcare setting, for example in implementing new IT projects or in clinical research trials (Shirley, 2011). However, the concept of using project management in the delivery of medical services or in healthcare quality improvement is fairly new, with no formal evaluation having been made (Couto, 2008). In this collaborative, project management training was provided during learning sessions and the action period. This step was taken as previous experience of working with frontline staff led the central
project team to believe that basic project management was an essential skill to acquire in order to help the improvement work run smoothly. In this research, respondents felt that basic project management skills within the improvement team were important to enable the team to be better organised and to complete necessary tasks during the collaborative work.

The next step in understanding the determinants of success to a collaborative is to look externally to the improvement team. Three determinants of success external to the project team were identified in this research: these were support from the management, support from the project team and good staff engagement.

Leadership of an organisation can influence quality improvement work taking place within an institution (Kaplan, et al., 2010). The literature was very clear in agreeing that support from senior leadership and management commitment of participating organisations are key determinants to success (Kilo, 1998; Øvretveit, et al., 2002; Wilson, Berwick and Cleary, 2003; Meredith, et al., 2006; Newton, et al., 2007; Lemay, et al., 2010). In this research, participants agree that support from senior leadership and management commitment were crucial to the collaborative work in helping them to overcome barriers and provide necessary resources for the improvement teams. Each participating area has a different context which senior leaders might not have appreciated. Therefore, the teams appointed key figures in their respective areas as improvement champions as a way to provide links to senior leaders and to secure support needed.

The literature suggests that good extensive support from the central project team drives the improvement within the collaborative more rapidly (Wilson, Berwick and Cleary, 2003). In this collaborative, the central project team helped by ensuring the teams kept to their project goals by guiding the teams to overcome barriers and by developing the various skills within each improvement team. The literature raised dependency on the central project team as a potential issue (Wilson, Berwick and Cleary, 2003), but the respondents in this study did not reveal this in the interviews. This was likely due to researcher influence: the respondents may not have offered the information due to the fact that the researcher also acted as facilitator in the project team.
Overall motivation to change within an organisation has been identified as a factor that can influence a quality improvement collaborative (Kaplan, et al., 2010). The overall motivation change within an organisation can be gauged by looking at frontline staff support to the project. In this research, good engagement of staff in the individual areas to obtain their support was identified as a crucial determinant of success. Good staff engagement promotes co-operation, helps to drive necessary changes and breaks down barriers encountered during the collaborative work. The respondents felt that they could reduce reliance on the improvement team by engaging the staff in their own areas. For example, tests of change and data collection can be delegated to other staff in the unit rather than it being completed by the improvement team. Multiple methods using various media such as emails, newsletter and short meetings were used to engage staff. Good topic selection was also linked to how well staff can be engaged. Respondents have pointed out that a good topic can easily motivate frontline staff to participate in improvement work.

5.4 Barriers to the Quality Improvement Collaborative

The understanding of barriers faced by a quality improvement collaborative has been shaped both by studies that looked directly into what barriers were faced by collaboratives (Gandhi, et al., 2000; Meredith, et al., 2006; Newton, et al., 2007) and studies looking at contextual factors affecting collaboratives (Kaplan, et al., 2010).

Time constraint is a common barrier faced by staff in different quality improvement collaboratives (Gandhi, et al., 2000; Meredith, et al., 2006; Newton, et al., 2007). In this research, participants agreed that lack of time was a major factor that hindered their improvement work. Respondents felt that both the staff in the improvement team and staff in their respective areas did not have enough time to work on the topic given to them. This resulted in the failure of the improvement teams to meet regularly, which impacted on their ability to manage their project. Time constraint leads to poor staff engagement areas as staff were not able to attend educational sessions organised by their improvement team. Interestingly, the respondents were divided on why they lack time; the frontline nursing staff felt that they genuinely did not have enough time in the day and they felt they have to prioritise clinical work ahead of improvement work. The nurses felt that they lacked time because of unpredictable clinical events occurring during their shift. They also suggested that the lack of time was related to the lack of
staff in their areas. In contrast, the dieticians and doctor were very critical of the opinion expressed by the nursing staff. The dieticians and doctor through their observation thought that lack of time was due to poor organisation and a failure to prioritise by frontline nurses. The dieticians and doctor felt that dialysis services were characterised by a long lull and short busy periods, where the frontline staff should have worked more during the quiet periods. On the other hand, the nurses might not appear to be doing things during the lull period as certain important tasks such as documenting notes can sometimes be seen as trivial by other observers.

The literature suggests that poor staff continuity and difficulty in retaining staff were barriers to success in a collaborative (Meredith, et al., 2006; Newton, et al., 2007). The reverse can also be true where good team continuity and the ability for a collaborative to adapt to changes in the improvement teams can determine the success of a collaborative (Øvretveit, et al., 2002). In this research, some participants felt that the poor continuity of staff in the improvement team has affected their work as it prevented them from being able to plan ahead and from being able to complete necessary tasks. Poor continuity of staff in some of the improvement teams reflects the staff turnover rate in their respective areas. The potential causes of high staff turnover in a healthcare setting include limited opportunity for growth, poor working conditions, lack of respect shown and poor leadership (Janssen, de Jonge and Bakker, 1999; Reeves, West and Barron, 2005).

Difficulty in finding staff with appropriate skills and appropriate team characteristics can be a barrier to implementing change (Meredith, et al., 2006). In this research, respondents felt that inappropriate team composition was a significant barrier to initiating and completing the collaborative work. One of the reasons for inappropriate team composition was difficulty in finding the staff with the right skills. The transplant team provides a good example of this: the respondents felt that one of the main reasons why the transplant team failed was because they failed to recruit a doctor into their team to help them understand cardiovascular disease and create the assessment bundle for the improvement work.

Senior leadership and management support is important as they can ensure adequate resources and remove barriers encountered in the collaborative work. The reverse can also have an effect on a collaborative, as lack of senior leadership and management support has been identified as a barrier (Meredith, et al., 2006; Newton, et al., 2007). In this research, respondents felt that action by senior
leaders and management prevented the right staff from being involved in the project team. The respondents felt that the senior leader and management should be more supportive by distributing the workload to help staff to be involved.

Availability of human and financial resources is one of the factors that can influence a quality improvement collaborative (Kaplan, et al., 2010). Having sufficient resources determines success and poorly-resourced teams can be a barrier to collaborative work (Gandhi, et al., 2000; Newton, et al., 2007). In this research, respondents felt that a lack of staff in their respective areas was detrimental to their improvement work. This leads to poor staff engagement as staff working in the areas affected were not able to attend teaching sessions organised by their improvement teams, nor were they able to complete tasks delegated to them. The reasons for the lack of staff in the relevant areas were unclear but a few reasons might be postulated: failure to attract new staff, poor management of the units or inadequate financial resources allocated by senior leaders in the organisation.

Another barrier identified from this research was lack of financial resources. In this research, only respondents from one team said that lack of finance was a barrier to their work, as two planned implementations of changes were delayed due to funding issues. Other teams were not faced with a financial barrier. This is likely to be due to the teams choosing to make changes with easy attainable goals (‘low-hanging fruit’) that often do not require many resources to implement.

This research found that shift pattern was not organised to facilitate improvement. The shift pattern was such that a nurse may be working in two different areas within a shift and may not see the same patients within the next few weeks. This prevented both the improvement team and staff in the area from completing tests of change as they were prevented from meeting with their colleagues and patients on a regular basis. Literature was absent on whether the way staff is organised in an institution can influence collaborative work. This research was able to highlight this as it was conducting a process evaluation as the work was going on, compared to retrospective evaluation which might miss it. Furthermore, this research interviewed frontline staff directly who were more likely to appreciate the impact of shift pattern.
5.5 Relationship of findings to wider theories

5.5.1 Learning and Learning Theory

Learning can be defined as ‘a change in behaviour including both observable activity and internal processes such as thinking, attitudes and emotions’ (Braungart and Braungart, 2008). Learning can be viewed as a process occurring in three different layers of a pyramid: individual level which forms the base, group level where a community of individual with same practices works together, and at organisational level where improvement of knowledge occurs within interconnected groups (Wenger 1998, Braungart and Braungart, 2008). Individuals have different learning styles – this can be broadly categorised into activist (one who enjoys experience itself), reflector (one who enjoy spending time to reflect), theorist (one who is excellent at making connections from ideas) and pragmatist (one who enjoys planning stage of learning) (McGill and Beaty, 1995). The challenge for any quality improvement method is to enable knowledge acquisition amongst participating staff with different learning styles.

There are elements in quality improvement collaborative that can help frontline staff learn and generate new knowledge rapidly. This study showed that there are several elements of the collaborative methodology, such as learning session and Model for Improvement, which frontline staff found it was helpful to help them achieve the desired improvement and to help them gain new knowledge to solve their problems. This might relate to how the elements help staff to be more effective in acquiring knowledge, and this can be explained by looking at learning theories and styles.

There are many competing learning theories that have been proposed to explain how individuals learn in the health care environment (Kaufman, 2003). However, there are three theories which can be can be explain how individuals gain new knowledge during quality improvement collaborative – these are action learning, experiential learning and adult learning theories.

Action learning theory explains how learning and action are linked together through reflective process within small learning group (Kaufman, 2003, McGill and Beaty, 1995). This theory proposed that learning can be summarised by using a simple equation of the sum of expert provided knowledge and questioning. On the other hand, experiential learning involves a continuous four-stage learning process involving cycle of active experimentation, concrete experience, reflective observation and abstract conceptualisation, where the learning process can begin at any stage and can occur as many times as
needed (Henry, 1989). This is similar to the Model of Improvement or Plan-Do-Study-Act cycle used to test change in quality improvement collaborative.

Adult learning theory explains makes five assumptions of a learner: learners should be treated as an adult, individuals can bring great deal of experience to the learning environment, learners need to be able to see application of what they have learnt, and individuals are interested in problem centred approaches and motivated to learn by themselves (Kaufman, 2003). All the five premise of adult learning can be linked to quality improvement collaborative as it allows frontline staffs who have a stake in the improvement topic to use their experience to improve by using specific methodology and detailed measurements.

All three theories can explain how staff with different learning styles can acquire new knowledge during quality improvement collaborative. In this study, most frontline staff found that expert faculty, learning session Model for Improvement and action period is helpful element of the collaborative. All of these elements promote all three theories of learning mentioned above to thrive amongst frontline staff and improvement groups involved in the improvement work. This helps the frontline staff and improvement team to acquire knowledge rapidly required to make changes to drive improvement.

5.5.2 Organisational Learning

Organisational learning is a process of improving organisational actions by adding or transforming organisational knowledge (Carroll and Edmonson, 2002). This process of learning involves iterative cycles of gathering, intuiting, experimenting, integrating and institutionalising new knowledge by invidividuals and groups within organisation and the organisation itself (Castaneda and Rios, 2007). This allows an organisation to apply new routine in order to meet changing goals – an organisation is said to learn when it alters its action to reflect different circumstances and new knowledge. Organisational learning is required to allow changes made and improvement achieved to be able to be spread and sustained.

There are several factors that promote organisational learning - these include individual capacity to learn, collective or group ability to learn, capacity for cultural learning, aptitude for structural learning and ability of leader to promote learning (Finger and Brand, 1999).

Several findings in this study can be linked to factors promoting organisational learning. Frontline staffs interviewed felt that their individual and group knowledge capacity was improved by certain elements
of the collaborative such as learning session and Model for Improvement. In addition, there were several features identified by frontline staff in this study that can help to promote organisational learning. Support from leadership and management was crucial to improve capacity for cultural learning and ability of leader to promote learning. Furthermore, frontline staff felt that provision of project management and improvement skill helped to improve their aptitude to structural learning.

There are also inhibitors to organisational learning in healthcare environment (Jack et al., 2010). Three relevant examples that can be related to this study are working in ‘silo’, learning via formal education and organisational politics.

Working in ‘silo’ where individuals and groups within complex healthcare environment tend to work in rigid structure based on professional groups or disease model rather than patient pathway (Nicolini, et al., 2008). This inhibits learning as communication between these ‘silos’ can be poor. This is made worse by the fact that learning in terms of formal education within the healthcare organisation has traditionally been focused on individual development, rather than team learning. This reinforces the concept of individual competency as more important than to promoting organisational learning (Carroll and Edmonson, 2002, Jack, et al., 2010). Participants believed that enrolment of teams, learning session and summit can help to break this ‘silo’ down by making participants from all professional group work together to improve care given to patients.

Organisational politics can also potentially restrict organisational learning (Jack et al., 2010). This can occur when individuals or groups react to perceived threat to protect their belief or interest within the organisation. In this study, frontline staff identified that support from senior leadership was crucial to help overcome barriers, especially relating to politics and relationship once changes were introduced.
Chapter 6: Conclusion

6.1 Introduction

The aim of this research was to improve understanding of the quality improvement collaborative by analysing how Salford Renal Network used the approach to implement changes and improve its service. This research was intended to explore reasons behind the success and failure of collaboratives which would explain conflicting findings on the effectiveness of this particular method. In addition, this research was intended to evaluate the process underlying a collaborative through the eyes of the frontline staff participating in the improvement teams. The information gained from frontline staff perspective can help to increase the knowledge base around quality improvement collaborative. In this context, three main issues were explored – the contribution of specific elements of the Breakthrough Series to an improvement work; the factors that determine the success of a quality improvement collaborative; the barriers faced by a quality improvement collaborative and solutions implemented to overcome them;

This chapter highlights the themes and key findings that emerged from the issues explored by this research.

6.2 Summary of Current Literature

The literature on quality improvement collaboratives can generally be divided into two categories based on two common research paradigms. The first category of research is consistent with the positivist research paradigm where the studies look at the effectiveness of collaboratives based on their outcome. A review of these studies concluded that the quality improvement collaborative has a positive but difficult-to-predict impact on clinical outcome and the evidence base underlying the collaborative remains limited.

Quality improvement collaboratives are complex, multifaceted interventions that can be influenced by many factors. The second category of research looks into this by evaluating the process and factors that influence the success or failure of a quality improvement collaborative. Studies have identified some determinants of success, barriers to collaboratives and influence of context on this particular improvement approach.
Most of the studies in the second category rely on opinions of authors based on their experience of a collaborative. Studies that used original data are scarce; this research adds value to the literature by providing more information based on original data obtained from frontline staff working on a quality improvement collaborative. This research provides an insight into what can make a small- to medium-sized collaborative within secondary and tertiary healthcare work.

6.3 Recurring Themes and Key Findings from this Research

Theme 1: Certain elements of the collaborative were perceived to be helpful to frontline staff performing a quality improvement work

The frontline staff in this research viewed four elements of the collaborative as helpful to their improvement work: expert faculty, learning session, model for improvement and summit. These elements have one common feature: they provide a mean for the frontline staff to learn from each other and be motivated to improve. These elements provide an avenue for the team to improve general and implementation knowledge. In addition, each of these elements helps the frontline staff in their own unique way - The expert faculty created the impetus to change, the learning session and model for improvement allowed the team to learn the best way to introduce the changes, whilst the summit motivated the participants to continue to spread and sustain the improvement achieved.

Theme 2: Inappropriate application of collaborative elements can impede improvement work performed by frontline staff

Each element in the Breakthrough Series was introduced to promote learning and facilitate improvement effort. However, the reverse can occur to impede improvement work if the collaborative element was introduced within inappropriate conditions. Topic selection is a good example of this, where inappropriate topic selection for the collaborative can de-motivate staff to change especially when frontline staff felt from the beginning that it does not confer clinical benefit. Another example is communication during action period where frontline staff found certain method such ones requiring use of technology difficult to use.
Theme 3: Applications of collaborative elements need to be tailored to accommodate different characteristic of participants and improvement teams

Specific elements in the collaborative were designed to help participants learn different skills and techniques. This research has shown that the different participants valued different methods of teaching and a collaborative should plan to accommodate this. This is consistent with studies on the adult learning process, which have shown that individuals have different learning styles. Phone conferences, web conferences and emails have been commonly used during the action period as a way to communicate and provide learning opportunities to participating teams. However, this research identified that frontline staff found that poor organisation of these elements, inadequate technology in their respective area and participant unfamiliarity with the technology, all of which can prevent good use of this particular method.

Theme 4: Improvement teams determine the success of a collaborative

The improvement teams in a collaborative are crucial to the success of the quality improvement work. The teams should have the right composition of individuals, ideally to include a subject expert and day-to-day leader. Certain topics selected for the improvement work will require a specific subject expert; the central project team need to be aware of and help the team to identify this. Good leadership of the improvement team enabled them to be better organised during the collaborative period. Leaders of the teams can be identified using different tools available, such as Belbin, and development of an individual as the leader should continue during the course of the collaborative.

Theme 5: Improvement teams need to be organised to ensure a successful collaborative

It is crucial for the improvement teams to be organised in how they approach the collaborative work. The teams need to be able to manage their time and resources appropriately. They also need to complete essential tasks such as conducting meetings, delegating jobs and tracking schedules. Frontline staff in the health service lack the experience and skill to do this; this research has shown that providing basic project management skills to the team during the learning sessions and action periods has helped the teams in this collaborative.
Theme 6: Support from senior leadership and management is crucial
The literature was unequivocal in suggesting that support from senior leadership and management was crucial in determining the success of a collaborative. The frontline staffs interviewed in this research agree with the literature: the support was crucial to obtain the necessary human, time and financial resources needed for the collaborative. Senior leadership and management can also help to overcome barriers encountered during the collaborative work.

Theme 7: There are many barriers to a quality improvement collaborative
This research has identified many barriers to the success of a quality improvement collaborative. Some of the barriers relate directly to the improvement team; for example, lack of time to perform collaborative work, inappropriate team composition by not including individuals with the right skill and poor continuity of improvement team as a result of staff leaving.

Theme 8: Frontline staff identifies contextual factors that can influence a collaborative
Contextual factors can affect organisational change, innovation, knowledge translation and quality improvement effort. Frontline staffs participating in this research have identified a few contextual factors that can promote or inhibit collaborative work. The former include support from senior leadership or management and good engagement of staff within their clinical areas, Factors that inhibit their collaborative work include poor organisation of staff within their clinical areas, poor staffing and time constraint. Certain factors inhibiting their collaborative work that was encountered in this collaborative can be linked to how the organisation was run. For example lack of staff encountered by certain areas in the collaborative can be related to high staff turnover and a high level of vacancies in the particular area. Another example is the shift pattern not being organised to facilitate improvement; this prevented staff from being able to complete tests of change or meet other staff to discuss improvement work.

6.4 Reflection on Methodology
This study used process evaluation through semi-structured interviews and analysis of existing and secondary data. This methodology was appropriate as it has provided this research with unique findings that can add to the understanding of the quality improvement collaborative.
Prospective data collection during the collaborative period by interviewing frontline staff helped to uncover certain issues which other studies may not have uncovered. For example, this research found that staff and shifts were not organised to facilitate improvement work.

The role of the researcher as collaborative facilitator and investigator in this research has enabled easy access to data and helped to develop a rapport with participants necessary for the interviews. However, it might have led to respondents withholding information during the interview: for example, the team did not comment on dependency on the central project team despite evidence in the literature that this can occur.

6.5 Implications for Future Research

This study has identified a gap in the literature, where future research should focus on evaluating the process around the quality improvement collaborative to help to better understand ways to improve the success of a collaborative work.

Frontline staffs participating in this research have provided some differing views on the collaborative elements, success and barriers to quality improvement collaborative. Further bigger research can be beneficial to see whether similar trend can be found. In addition, there are suggestions from the frontline staffs that organisational context can influence quality improvement collaboratives. Future research should attempt to clarify this further.

This study was conducted on a small- to medium-sized collaborative under the auspices of a single organisation. Future research should attempt to conduct similar research on a bigger collaborative that involves multiple organisations to improve generalisability and to assess the reproducibility of this research.

6.6 Implications for Future Collaborative

This study can help future collaboratives in multiple ways. First, this study have summarised the latest evidence on effectiveness, determinants of success, barriers to improvement and contextual factors relating to quality improvement collaboratives in the first two chapters. The review of literature can help future collaborative to plan their work based on best available evidence around quality improvement collaborative to ensure success of their improvement work.
This study have obtained the views of frontline staffs participating in a quality improvement collaborative on which element of collaborative that has helped them and how to make the element more useful for them. The cross case analysis and subsequent discussion revealed that certain elements helped to promote learning and improve motivation which was useful in helping frontline staff achieve their improvement aim. Future collaborative can focus their attention on promoting these elements in their collaborative. Analysis of the results has also revealed that inadequate implementation of certain elements impair these elements from working well. An example of this was during the setting up phone and web conferences which occurred without having adequate technology which caused the frontline staff to stop being involved in the particular element of collaborative. Future collaborative can learn from this by analysing their own context and environment to help adapt each elements of collaborative well.

This study also looked into frontline staff perspective on what factors that can influence the success of an improvement collaborative and barriers preventing it. The cross case analysis showed that some of the findings of this study was consistent with what has been noted previously in the literature, such as team composition and support from senior leadership was helpful to success of improvement collaborative. In addition, there were other determinants of success and barriers to improvement that have been identified by the analysis of result and following discussion chapter that future collaborative can use to plan their improvement work. For example, the result of this research shows that future collaborative should improve engagement of other frontline staff to help reduce the burden of work and sustain successful changes made.

Future collaborative can use the findings from this research to set out their improvement to help their frontline staff work better in the improvement collaborative. Frontline staffs are important facet to any collaborative as they are involved in testing, implementing and measuring necessary changes that can lead improvement and attainment of the collaborative aim. Findings from the cross case analysis and subsequent discussion showed that certain aspect such as team consistency is should be maintained during the collaborative work to improve knowledge retention and morale, appropriate time is ring-fenced by senior leadership for frontline staff to introduce changes and necessary skills such as project management are taught to staff to help them cope with their improvement work.
Lastly, the eight recurrent themes identified in the conclusion can be used by future collaborative as a reminder or checklist to help plan and implement their collaborative work.

6.7 Summary

This research was able to elicit several unique points by performing an evaluation throughout the collaborative work and by collecting data from frontline staff. The themes, key findings and result identified in this research can certainly be applied to other quality improvement collaboratives in healthcare. Future collaboratives can use the findings in this research to help plan their improvement work by identifying which elements of collaborative works well, establishing determinants of success and eliminating barriers to improvement.

This research initially set-out to predict success or failure of a collaborative improvement work by seeking frontline staff view on this. Information gleamed from this research have shown that inappropriate application of collaborative elements can lead to failure of improvement work. A good example was inappropriate selection of topic at the beginning can cause immediate failure of collaborative work. Furthermore, success of a collaborative improvement work is a balance between presence of certain determinants of success and barriers within improvement teams and organisation it works in. Successful teams in this collaborative have more determinants of success in their team rather than barriers, whilst team that failed encountered only barriers to their improvement work.
### Appendix 1: Controlled Studies Reviewed by Schouten

<table>
<thead>
<tr>
<th>Study reference</th>
<th>Domain of care</th>
<th>Type of Collaborative</th>
<th>Method and sample</th>
<th>Key Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horbar, et al. , (2001)</td>
<td>Preterm infants: infection or chronic lung disease</td>
<td>Vermont Oxford Network</td>
<td>Controlled before and after study</td>
<td>Reduction in infection: Coagulase negative staphylococcal infection rate (12.3% v 16.5% infants)Reduction in oxygen supplementation rate (34% v 38.7% infants)</td>
</tr>
<tr>
<td>Rogowski ,etal., (2001)</td>
<td>Preterm infants: infection or chronic lung disease</td>
<td>Vermont Oxford Network</td>
<td>Controlled before and after study</td>
<td>Reduction of treatment cost per infant (median $57 606 before measurement v $45 874 after measurement)</td>
</tr>
<tr>
<td>Benedetti, et al., (2004)</td>
<td>Diabetes</td>
<td>Breakthrough Series</td>
<td>Controlled before and after study</td>
<td>Non significant change to glycaemic control end organ surveillance Improvement in blood pressure control Blood pressure &lt;130/85 (49% v 35% patients)</td>
</tr>
<tr>
<td>Landon, et al .,(2004)</td>
<td>HIV</td>
<td>Breakthrough Series</td>
<td>Controlled before and after study</td>
<td>No significant improvement</td>
</tr>
<tr>
<td>Horbar, et al., (2004)</td>
<td>Preterm infants: infection or chronic lung disease</td>
<td>Vermont Oxford Network</td>
<td>Randomised controlled trial</td>
<td>Increase surfactant given in delivery room (54.7% v 18.2%)Improved first dose surfactant given after two hours (9.4% v 24.9%)</td>
</tr>
<tr>
<td>Home,r et al. ,(2005)</td>
<td>Asthma</td>
<td>Breakthrough Series</td>
<td>Randomised controlled trial</td>
<td>No significant improvement</td>
</tr>
<tr>
<td>Mangione-Smith, et al., (2005)</td>
<td>Asthma</td>
<td>Breakthrough Series</td>
<td>Controlled before and after study</td>
<td>Improvement in process indicators (e.g. overall asthma process of care summary score (56% v 40% patients)) Improvement in quality of life: General quality of life (80.2 v 77.0); asthma specific quality of life: treatment</td>
</tr>
<tr>
<td>Study</td>
<td>Condition</td>
<td>Methodology</td>
<td>Design</td>
<td>Findings</td>
</tr>
<tr>
<td>---------------------</td>
<td>--------------------</td>
<td>----------------------------------</td>
<td>-----------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Schonlau, et al., (2005)</td>
<td>Asthma</td>
<td>Breakthrough Series</td>
<td>Controlled before and after study</td>
<td>Some improvement in process indicators (e.g. overall asthma process of care summary score (46% v 38% patients)) Improvement in one self management indicator (attended educational session (20% v 5% patients))</td>
</tr>
<tr>
<td>Asch, et al., (2005)</td>
<td>Chronic heart failure</td>
<td>Breakthrough Series</td>
<td>Controlled before and after study</td>
<td>Improvement in counselling indicators (e.g. Drugs (44% v 17% patients); diet (46% v 11% patients); exercise (42% v 12% patients)) Improvement in half of drug indicators (ACE inhibitor for left ventricular ejection fraction ≤40% (93% v 87% patients); lipid lowering therapy for coronary artery disease (66% v 64% patients) No improvement in outcome, diagnostics and follow-up indicators</td>
</tr>
<tr>
<td>Baker, et al., (2005)</td>
<td>Chronic heart failure</td>
<td>Breakthrough Series</td>
<td>Controlled cross sectional study</td>
<td>Improvement in half of the knowledge indicators (e.g. Not to drink more fluids than normal (69% v 53% patients); checkweight (84% v 44% patients))</td>
</tr>
</tbody>
</table>
## Appendix 2: Controlled studies published after Schouten’s systematic review

<table>
<thead>
<tr>
<th>Study reference</th>
<th>Domain of care</th>
<th>Type of Collaborative</th>
<th>Method and sample</th>
<th>Key Finding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaplan, et al., (2011)</td>
<td>Infection in pre term infants</td>
<td>Breakthrough Series</td>
<td>Interrupted time study</td>
<td>Improve compliance with catheter insertion and care component Reduction in infection (18.2% to 14.3%)</td>
</tr>
<tr>
<td>Schouten, et al., (2010)</td>
<td>Diabetes</td>
<td>Breakthrough Series</td>
<td>Controlled before and after study</td>
<td>Modest improvement in blood pressure &amp; mean LDL levels Positive but statistically insignificant improvement to Hba1c</td>
</tr>
<tr>
<td>Barcelo, et al., (2010)</td>
<td>Diabetes</td>
<td>Breakthrough Series</td>
<td>Randomised controlled trial</td>
<td>Increase in proportion of patient with good glycaemic control (28% to 39%) Increase in proportion of people with quality improvement goals.</td>
</tr>
<tr>
<td>Kritchevsky, et al., (2008)</td>
<td>Preoperative prophylaxis</td>
<td>Breakthrough series</td>
<td>Longitudinal cluster randomised study</td>
<td>No difference in change in proportion of patients who received a properly timed antimicrobial prophylaxis dose No difference in other measures in both groups</td>
</tr>
<tr>
<td>Howard, et al., (2007)</td>
<td>Organ donation</td>
<td>Breakthrough Series</td>
<td>Controlled before and after study</td>
<td>Improve donation rate (60% vs. 51%)</td>
</tr>
</tbody>
</table>
### Appendix 3: Improvement Teams

#### Bolton Renal Unit Improvement Team

<table>
<thead>
<tr>
<th>Staff</th>
<th>Learning sessions attended (out of 4)</th>
<th>Number of months in the collaborative (out of 12)</th>
<th>Role in team (according to Belbin inventory)</th>
<th>Interviewed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff Nurse A</td>
<td>4</td>
<td>12</td>
<td>Co-ordinator</td>
<td>Yes</td>
</tr>
<tr>
<td>Staff Nurse B</td>
<td>2</td>
<td>6</td>
<td>Team Worker</td>
<td>No</td>
</tr>
<tr>
<td>Health Care Assistant A</td>
<td>4</td>
<td>12</td>
<td>Communicator</td>
<td>Yes</td>
</tr>
<tr>
<td>Unit Manager A (Team champion)</td>
<td>1</td>
<td>12</td>
<td>-</td>
<td>Yes</td>
</tr>
</tbody>
</table>

#### Community Dialysis Improvement Team

<table>
<thead>
<tr>
<th>Staff</th>
<th>Learning sessions attended (out of 4)</th>
<th>Number of months in the collaborative (out of 12)</th>
<th>Role in team (according to Belbin inventory)</th>
<th>Interviewed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialist Nurse A</td>
<td>4</td>
<td>12</td>
<td>Co-ordinator</td>
<td>Yes</td>
</tr>
<tr>
<td>Specialist Nurse B</td>
<td>3</td>
<td>12</td>
<td>Completer</td>
<td>No</td>
</tr>
<tr>
<td>Health Care Assistant B</td>
<td>4</td>
<td>12</td>
<td>Team Worker</td>
<td>Yes</td>
</tr>
</tbody>
</table>

#### Salford Renal Unit Improvement Team

<table>
<thead>
<tr>
<th>Staff</th>
<th>Learning sessions attended (out of 4)</th>
<th>Number of months in the collaborative (out of 12)</th>
<th>Role in team (according to Belbin inventory)</th>
<th>Interviewed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Practitioner 1</td>
<td>1</td>
<td>4</td>
<td>Resource investigator</td>
<td>No</td>
</tr>
<tr>
<td>Staff Nurse C</td>
<td>3</td>
<td>12</td>
<td>Team Worker</td>
<td>Yes</td>
</tr>
<tr>
<td>Staff Nurse D</td>
<td>1</td>
<td>6</td>
<td>Team Worker</td>
<td>No</td>
</tr>
<tr>
<td>Staff Nurse E</td>
<td>0</td>
<td>3</td>
<td>-</td>
<td>No</td>
</tr>
<tr>
<td>Staff</td>
<td>Learning sessions attended (out of 4)</td>
<td>Number of months in the collaborative (out of 12)</td>
<td>Role in team</td>
<td>Interviewed?</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------------------------------</td>
<td>---------------------------------------------------</td>
<td>--------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Health care assistant C</td>
<td>3</td>
<td>12</td>
<td>Plant</td>
<td>Yes</td>
</tr>
<tr>
<td>Dietician A</td>
<td>4</td>
<td>12</td>
<td>Co-ordinator</td>
<td>Yes</td>
</tr>
<tr>
<td>Dietician B</td>
<td>4</td>
<td>12</td>
<td>Co-ordinator</td>
<td>Yes</td>
</tr>
<tr>
<td>Doctor 1</td>
<td>2</td>
<td>12</td>
<td>Implementer</td>
<td>Yes</td>
</tr>
<tr>
<td>Transplant Improvement Team</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specialist Nurse C</td>
<td>2</td>
<td>12</td>
<td>Co-ordinator</td>
<td>Yes</td>
</tr>
<tr>
<td>Specialist Nurse D</td>
<td>2</td>
<td>12</td>
<td>Implementer</td>
<td>Yes</td>
</tr>
<tr>
<td>Specialist Nurse E</td>
<td>2</td>
<td>9</td>
<td>Team Worker</td>
<td>No</td>
</tr>
<tr>
<td>Wigan Renal Unit Improvement Team</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Administrator</td>
<td>4</td>
<td>12</td>
<td>Co-ordinator</td>
<td>Yes</td>
</tr>
<tr>
<td>Staff Nurse G</td>
<td>4</td>
<td>12</td>
<td>Team Worker</td>
<td>Yes</td>
</tr>
<tr>
<td>Staff Nurse H</td>
<td>2</td>
<td>12</td>
<td>Implementer</td>
<td>No</td>
</tr>
<tr>
<td>Unit Manager B (Team Champion)</td>
<td>2</td>
<td>12</td>
<td>-</td>
<td>Yes</td>
</tr>
</tbody>
</table>
References


Deo, S., McInnes, K., Corbett, CJ., Landon, BE., Shapiro, MF., Wilson, IB., Cleary, PD. (2009), "Associations between organizational characteristics and quality improvement activities of clinics participating in a quality improvement collaborative", Med Care 47(9): 1026-1030.


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