Managing major health service and infrastructure transitions

A comparative study of UK, US and Canadian hospitals

James Barlow, Jane Hendy, Danielle Tucker

Introduction

Significant organisational change in healthcare is increasingly common as health systems evolve in response to innovations and process improvements, and to the changing demands for healthcare. Sometimes new health service designs need to be supported by changes to the healthcare infrastructure if they are to be successfully implemented and sustained – service delivery models and its built and technical infrastructure must be transformed simultaneously. Just tackling one of these issues is challenging for all involved. Doing both these tasks at the same time can be overwhelming and risky.

But there can also be advantages in such radical change. It can provide an opportunity to radically rethink ways of delivering healthcare. Conducting simultaneous infrastructure renewal and service redesign means that care processes, not plausible in the old infrastructure, may be more easily designed into the new facility.

Major restructuring efforts are rarely systematically evaluated with outcomes measured or best practice shared (Walston and Chadwick, 2003). However, we do know that 'whole system' organisational change in healthcare – change which impacts on all areas of the organisation across all levels and stakeholder groups – is often hampered by a failure to plan effectively (NHS, 2008). It is generally accepted that the successful introduction of healthcare innovations requires the approval of relevant stakeholders (e.g. physicians, government bodies, primary care providers), and that planning and implementing major changes in healthcare service or infrastructure design requires practice-based examples to learn from.

While there is considerable experience in the planning and implementation of health services changes, there is little written about combined services and infrastructure change. Organisations searching for such information may have to look for examples beyond those found in their own country. Studying similar cases across different organisational and international contexts also increases the likelihood of determining pivotal factors that underpin success.

Research approach

The aim of this project was to investigate the transition planning, stakeholder engagement and management processes underpinning a move from an existing hospital to another new facility. This inevitably involved significant redesign of healthcare processes and services, along with their supporting infrastructure.

We adopted a comparative case study approach as this offers increased external validity, creating more generalisable forms of knowledge (Yin, 2009). We were assisted in our search for suitable case studies by the US-based Center for Health Design (www.healthdesign.org), an evidence based research group assessing design decisions and innovation in new healthcare facilities through its 'Pebble Project' programme (Joseph and Hamilton, 2008).

The three selected cases all involved replacing an older hospital with multi-bed wards. Each new hospital has an all-single room configuration, and is approximately the same size (300-500 beds). Each approached the project to redesign organisational and work process in its own way. The challenges for each were significant, involving a shift from a ward to single room configuration and the incorporation of significant internal process changes (see box 1)

The period over which each of the three projects unfolded was similar. In each case the old hospital building was either demolished or converted to non-clinical uses such as conference or teaching space, marking a clear distinction between the previous hospital and the new building. In two of the three cases there was physical move to a site some distance away from the old hospital.

Box 1. Single occupancy rooms

• Single occupancy rooms present a number of challenges to healthcare workers in hospitals, including different relationships with co-workers and patients, changed perceptions of patient visibility, increased by-the-bed patient care interactions, altered resource allocation and the need for different communication techniques (Mooney, 2008; Young and Yarandipour, 2007; Ulrich et al., 2008; Maben et al. 2015a, 2015b).

• Single rooms accounted for around 28% of beds across the UK's National Health Service (NHS) at the time of the research. In the US and Canada there is longer experience of single occupancy rooms, but the transition from a ward model to this models is still relatively under-researched.

• Evidence for the benefits of single-room accommodation, derives mainly from empirical work in the USA and Scandinavia, includes reduced infection rates, fewer medical errors, faster patient recovery rates, increased patient comfort, privacy and safety, and increased patient satisfaction (see Maben et al. 2015a, 2015b). Other studies of patients show increased feelings of isolation, especially in the elder population as a result of single rooms (Mooney, 2008). Despite this conflicting evidence hospitals in in health systems around the world are beginning to develop a single room approach to hospital healthcare delivery, at least for a large proportion of hospital beds.

Box 2. Influences on organisational approaches to change management

A number of factors were found to impact on the organisations' decisions in designing their approach:

• *Experience of organisational change*– where an organisation has extensive experience of organisational change they are more likely to focus on this experience either as a means to improve on previous change management or to bring in new strategies.

• *Funding of the project* – this impacts on the level of investment, often with stipulations on how and what funding should be allocated.

• *Access to facility* – often dictated by financial arrangements but also the logistics of the transition particularly move day and facility opening. Pivotal are both the amount of time the organisation has access to the facility prior to opening and to what extent the building is viewable and fit for purpose during this access.

• *Organisational culture* – how the organisations structures, goals and policies dictate their transition options and how receptive organisational members are to change.

• *External view of the project* – public, political or other stakeholders' attitudes to the new building are a determining factor. The source of funding for the facility also plays a role in expectations of expenditure.

Our data comprises 155 interviews, complemented by analysis of 205 documents, including internal reports and minutes, publicly available reports and research, and media coverage. We also made field notes from 36 hours of observations, including several tours of the old and new hospitals (both when under construction and completed), informal research observations and impressions, and attendance at staff visits to 'mock-up' of the new designs (see Appendix).

Different approaches to change

Although there were similarities across all the three cases, each adopted a different approach to the way it managed the transition from one site to another. Some factors which influenced the organisation's approach to change management are described in box 2.

When organisational change occurs, organisations make reference to past events and the collective attitudes, behaviours and actions of various stakeholders influence the change management process. Organisations have their own history and context which plays a role in their management and decision-making style. Our three case studies were no exception. Their history, memory and context helped influenced their approaches to transition planning and implementation.Residual effects of organisational context can impact change management in the following ways:

• Using past experience of change management can help build confidence and trust between the employees and management teams within the organisation (Lines et al., 2005).

• Negative memories of previous organisational experiences can act as a springboard – both positive and negative – for creating a new set of principles (Anteby and Molnar, 2012).

• Attitudes to risk-taking often correlate with the organisation's history of success with previous risky decisions or behaviours (March and Shapira, 1987).

• Residual effects of previous experience may impact on the way an organisation attempts to be seen (e.g. through the media) and its attempts at external engagement (Weick and Quinn, 1999).

• The momentum of the transition project can be harnessed or restrained by individuals within the organisation and their understanding of the change (Poels et al., 2011).

These factors led each of our case studies to take a different approach to the various aspects of change management, summarised in Table 1.

Pembury Hospital (now renamed as Tunbridge Wells Hospital), Maidstone & Tunbridge Wells NHS Trust, England.

This project involved the demolition of Pembury (91 beds) and Kent & Sussex (281 beds) Hospitals and reconfiguration of services around a new hospital on a greenfield site (see Maben et al., 2015a). All acute services for the western part of the county of Kent were to be consolidated at this site. The new facility (512 beds) opened over two phases in January and September 2011. The transition involved moving from a mixture of 4/6 bed bays and some larger wards with up to 22 beds to a 100% single-room configuration. The new facility was funded under the UK's Private Finance Initiative (PFI), where a consortium of constructors, banks, facilities management operators and the local NHS Trust combine to design, build and operate a new hospital.

An important focus for the organisation – the local NHS Trust – was on recruiting new people to manage the transition. Experienced individuals at both the board level and the project level were hired. A new executive team was brought in following a high profile infection scandal and removal of a majority of the existing board in 2008. Finally, a team was established, including a number of new recruitments, to manage the PFI relationships with the rest of the consortium.

Virtua – Voorhees Hospital, New Jersey, USA.

This project involved the construction of a new 398 bed hospital on a greenfield site to replace one of several hospitals (Voorhees) owned by Virtua, a private sector healthcare provider in northern New Jersey. The focus of this hospital is on women's and children's services. Based in a competitive local health market, Virtua wished to replace the old hospital, mainly comprising semi-private (2-bed) rooms or bays, with a new state-of-the-art all-single bedroom facility. The organisation operates on a non-profit basis and financed the new facility internally.

At this organisation there was a special focus was on process improvement. The transition to the new hospital formed part of Virtua's programme to re-engineer its business processes using tools such as Six Sigma, Lean and Change Acceleration Process. This had been started before the new hospital was planned, helping to inculcate a culture of process change and continuous improvement across the organisation.

Royal Jubilee Hospital Patient Care Centre, Vancouver Island Health Authority, Canada.

The project involved the construction of a new 500 bed, 83% single room, inpatient facility to accompany a diagnostics and treatment centre completed in the early 2000s on an existing brownfield site. This was designed to replace an outdated 612 bed facility, comprising mainly 4/6 bed bays. The new facility was funded under a public-private financing partnership, similar to the Pembury model.

At this organisation, a dedicated project team absorbed most of the burden of change management including infrastructure and stakeholder engagement issues. This team took on responsibility for training and educating frontline staff, therefore circumventing and reducing the workload of general managers.

The impact of different change approaches

Stakeholder engagement

The difficulty of transformational change in healthcare has long been acknowledged, with a lack of engagement from stakeholders cited as a key reason for limited success (e.g. McNulty and Ferlie, 2004). The literature on 'social influence' focuses on a top-down cascade model of engagement with middle managers, where senior managers influence those directly below them in the hierarchical layers. Middle managers are often criticised for breaking the chain of engagement through a lack of time, influence or commitment (Birken et al., 2012). Our analysis shows how more innovative strategies for engaging frontline employees and other stakeholders were employed across our case studies.

Figure 1 shows an overview of the different strategies used by the three hospitals, comparing their approaches to stakeholder engagement. In each hospital the pyramid represents the organisational hierarchy, with top management (those concerned with the overall strategic direction of the organisation), middle managers (those concerned with the operational day to day general management of the hospital) and frontline staff (who perform the clinical and non-clinical work in the new facility and will be directly affected by the change). The arrows represent the organisations engagement priorities and the horizontal lines represent intentional (solid) or unintentional (broken) limitations of engagement. So for example, in Pembury the

	Pembury, UK	Voorhees, USA	Royal Jubilee, Canada
Primary drivers of change	• Increase quality of acute care • Modernisation of old facilities • Infection control • Reconfiguration of service provision across the Trust	• Demographic changes (growth in demand for women & children services) • Introduction of new technology • Process improvement	• Demographic growth (65+ population) • Staff retention • Energy efficiency • Modernisation of old facilities.
External context	• Community and local political resistance to reconfiguration of some services. • High profile subject to media scrutiny, partly due to earlier infection control scandal	• Competitive healthcare market, other local providers in direct competition. • Engaging local media as marketing strategy	• Generally supportive but subject to media scrutiny
Additional changes and complexities	• Service reconfiguration across the area served by the Trust to focus on acute services in one place.	• Introduction of new electronic medical records systems 3 months prior to opening new hospital • Forms part of an organisation-wide process improvement programme	• Incremental introduction of new electronic medical records system before, during and after opening of new facility
Training and education	• Change management and leadership training for middle and senior managers across the whole trust. • Orientation and basic training for all staff	• Continuing process improvement training for selected individuals to become Six Sigma agents • Management engineers organised 'Move day' drills and simulations • Orientation and basic training programme for all staff	• External consultant sought to advise on training and education programme. • Hands on (in building) training for all frontline staff
Timescale of move from old facilities	• Two-phased move into new building over period of 9 months	• Single 'move day' for all services	• One phase of move in one days but incremental technology implementation afterwards
Use of human resources	• Development team created to manage the design, construction and finance • Project managers seconded from each clinical division to lead implementation	• Core site team comprising existing management team for the part of the organisation moving to the new facility • Facilitator- six sigma agents (trained in process improvement) and management engineers leading change implementation with the core site team	• Project management team created external to existing organisational structure

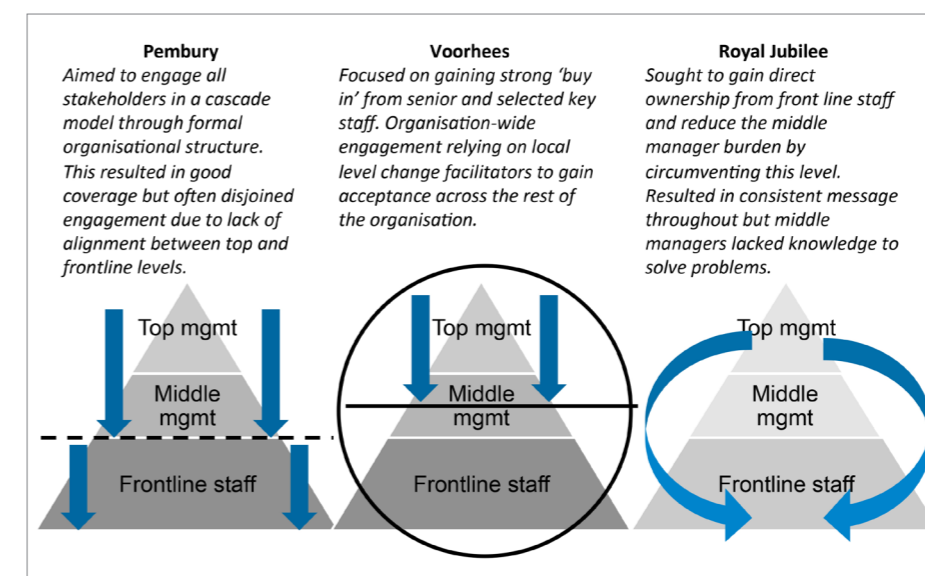Table 1, Case study change management approaches comparison.

Figure 1, Approaches to stakeholder engagement.

priority was to engage from the top equally through all levels. However, these engagement activities reached a barrier at the middle management level, so another stream of engagement activity took place from middle management downwards.

At Pembury, the organisation used a 'cascade model' of information dissemination, using the existing clinical divisional structure and existing communication pathways to disseminate change information. A project office was created to handle the infrastructure aspects of the change. This office included members of the construction company, a programme board given the task of change management and a move and migration team responsible for the 'move day' logistics itself. In response to a perceived lack of engagement from clinical divisions, links between the project team and the division were created 18 months prior to the transition.

"[referring to the creation of the project manager roles for each clinical division]…the PFI project was fairly well developed at that time and they wanted to make sure that it continued to be successfully delivered [at the frontline level], so some very peculiar management arrangements were put into place at that time, because there was no representation as such from the Trust."
(**Pembury** – Middle manager)

"[The project office was] also very much encouraging locally each department division to supplement [organisation-wide communications], to complement that with much more local personal issues."
(**Pembury** – Senior manager)

The objective of the organisation's internal stakeholder engagement strategy was to make use to a large extent of the existing communication channels and structure of the organisation, which was divided into four divisions. A team consisting of a doctor, a nurse and an operations manager led each division and they were later joined by a project manager specifically to deal with the change management. These project managers were responsible for creating a link between the project office and

the divisional leaders. Some of these links were stronger than others (see section 4.2 below) and in some areas resulted in a lack of alignment between senior management strategies and the understanding and implementation of these strategies by frontline staff.

"We're trying to assert a cascade of communication, which does not work well at all. So, we rely on a lot of communications directly accessible to all staff… briefing our directors and managers with instruction that they share and personalise, if you like, the messages that we're pushing down. I think we're still early days of making that work well."
(**Pembury** – Senior manager)

Nevertheless, very few instances of a total lack of engagement or knowledge were reported by the organisation, suggesting that by using these existing channels and structure messages were getting through.

At Virtua, the organisation focused on developing early on a culture of process improvement and organisational readiness, seeking to minimise the impact of changes associated with the transition. This was achieved by adopting a process improvement culture and a culture of constant change and improvement at local levels across the organisation.

"… the culture at Virtua, I think, really drove the success of everybody being involved in it, without a question."
(**Voorhees** – Middle manager)

These process improvements were facilitated by the use of tools and philosophies such as Lean, Six Sigma, Change Acceleration Processes and process engineering. Specially trained process improvement experts (see section 4.2 below) were deployed throughout the organisation, working on specific process improvement and re-engineering projects. This approach resulted in high commitment and 'buy in' from senior management and selected individuals, but this was manifested less strongly by the majority of the workforce.

"We had some ambivalence within our own team saying, okay, I'm not sure it's going to work. We've been doing it this way, how're we going to get people to do it that way."
(**Voorhees** – Frontline manager)

"I think the bigger benefit there is just in the acceptance and driving the culture and getting everybody kind of moving in the same direction."
(**Voorhees** – Senior manager)

Our data showed that although the organisation was able to reach a wide variety of employees with these techniques, there still existed pockets of resistance from those more indirectly impacted by change.

"I mean, there were staff involved from almost every department, it was really a Virtua system-wide approach.
(**Voorhees** – Middle manager)

"I've heard a number of people on other campuses make off-hand comments about [how] we can't get this fixed or upgraded or spend money on what we want to do here, it's all going to the new hospital."
(**Voorhees** – Middle manager)

"And doctors are hard to convince, the talk I heard earlier on was you'll never build this, even when steel was going up they didn't believe we were going to build it."
(**Voorhees** – Senior manager)

Finally, at Royal Jubilee, the organisation created an 'all powerful' project office which was detached from the main organisation. The objective was to relieve the workload of operational middle management staff who are traditionally burdened by change implementation (Balogun and Johnson, 2004) and create a direct link to motivate frontline staff.

"Our target audiences were all the frontline staff and those people who were providing the hands-on care; porters, the building's maintenance guys, the protection services guys, those sorts."
(**Royal Jubilee** – Consultant)

The members of the project team were appointed according to their project management and change management skills, and encouraged to develop these further as part of a long term strategy for future change projects by the organisation. This circumvention approach resulted in high levels of motivation and consistent engagement from frontline employees in the run up to the transition but less support from middle managers (although also seemingly less work overload and stress).

"[the approach was] to work with all the [frontline] users, anybody that is going to provide any type of care or service, and get them all working together, rather than in silos, and operationalize the building [to get it ready]."
(**Royal Jubilee** – Project team)

"…small café sessions that introduced [frontline staff] to the space, and it's to introduce them to the different technologies. They were highly engaged"
(**Royal Jubilee** – Consultant)

"But [middle] manager level, no. They were invited to attend the sessions, and several of them did for that hands-on piece, but in terms of a targeted training for them, there wasn't anything done, no."
(**Royal Jubilee** – Consultant)

However, once the facility was built the project team disbanded and moved onto the next project, problems with the new building or service design became the responsibility of the operational middle managers. These middle managers lacked the background knowledge of the design decision-making processes

(i.e. the underlying principles of why parts of the system were designed in a certain way to support new work practices), instead, middle managers used their experience from the former environment as a basis for problem solving and decision making which led to attempts to return to previous ways of working.

> *"...so even though we spent all this time on the units before, and talked it through the systems and had trained the way the units were set up... what we saw was that people were very quickly trying to replicate the old order in the new environment."*
>
> (**Royal Jubilee** – Project team)

Change agents and project teams

Within the organisational change literature there are many assumptions about 'change agent' roles and how these should be enacted. Our analysis suggests that the case studies used change agents to facilitate and encourage change in different ways by carefully positioning them within the organisation or by emphasising a particular role (e.g. as motivator, connector or facilitator of change). Table 2 shows the types of agents used by each case study.

Different branches of the research literature on change agents favour different terms and definitions (Bamberger, 2008; Parry, 2003; Chreim et al., 2012) but essentially the characteristics of successful change agents include a combination of passion and persistence, and interpersonal skills to facilitate change and influence others. These individuals encourage teambuilding and communicate meaning to professional groups through networks which cross formal and informal boundaries (Birkinshaw et al., 2008; Hendy and Barlow, 2012; Schon, 1963; Soo et al., 2009). They actively promote and enable change for the good of the organisation and in doing so contribute to its success (Dopson et al., 2010; Greenhalgh et al., 2004; Locock et al., 2001).

At a practical level it is often assumed that the outcomes of appointing change agents are predictable, predominantly positive and relatively simple to achieve (Schon, 1963; Hendy and Barlow, 2012; Greenhalgh et al., 2004). The complexity of the role is often underestimated both in the literature and in practice, because we do not understand how organi-

sations use change agents and differentiate responsibilities and position in the change process, especially when this position is temporary. Briefly, organisational literature distinguishes between the following roles and activities:

- **Change agent**s – Encourage readiness for change in others and facilitate the change process during its implementation (e.g. Rogers, 2003).
- **Champions** – Actively and enthusiastically promotes innovation and change to others; identify with the idea personally (personal commitment), beyond normal job requirements (Howell and Shea, 2001; Schon, 1963).
- **Boundary spanners** – Perform a linking function that bridges and facilitates communication and coordination between internal members of the group or organisation across professional boundaries (e.g. Williams, 2002).
- **Knowledge brokers** – described as "The human force behind knowledge transfer, finding, assessing and interpreting evidence, facilitating interaction and identifying emerging research questions" (Ward et al., 2009).

	UK Pembury	USA Voorhees	Canada Royal Jubilee
Who?	Divisional Project Managers (DPMs)	'Black belts' and management engineers	PCC Project Team
Placement	Link between the project office and Executive and Divisional User Groups	Management – co-ordinating local networks	External to management structure – project office
Role	Boundary spanners / knowledge brokers	Change agents (facilitators)	Champions

Table 2, Change agents' placement and role in the case studies.

The organisation's chosen type of agent reflects their strategy for engagement with staff. At Pembury, four 'project managers' were recruited to translate operational procedures from the hospital design to the clinical divisions which would be working in the new facility. They were positioned between the 'New Hospital Development Team' who were managing the build and the four clinical divisions within the Trust. The way this role was enacted is best characterised as a boundary spanning or knowledge broker role as the main tasks involved filtering and translating communications and facilitating dialogue between relevant groups. These individuals were relied on heavily to cascade messages throughout the formal

organisational hierarchy (see figure 2). However, this resulted in bottlenecks when communication flows became busy. This approach also relied heavily on the effectiveness of selected individuals, and results were therefore mixed:

> *"I perhaps would question whether they've got [the right personal skills] if I'm honest."*
>
> (**Pembury** – Senior manager).

> *"Without a doubt I think there is a real lesson in the type of person that you have in the role…some of the individuals in those roles have been far better at it than others. Some have been better at that liaison role back with their own divisional teams than others, and some reached out across into the other parts of the organisation better than others – there wasn't consensus about what was the priority of those individuals."*
>
> (**Pembury** – Middle manager/Project manager)

At Virtua, the organisation relied heavily on process improvement specialists to inspire the culture of change they sought to create. They used their own management engineers and 'black belts' to harness the organisational culture and bring about change, and were resistant to bringing 'outsiders' into the organisation:

> *"Most organisations, when building, have consultants all over the place. We pretty much use our engineers and our black belts to do the whole design specification implementation."*
>
> (**Voorhees** – Senior manager)

> *"If we had had an outside company come in and do it for us they wouldn't have understood our culture. They wouldn't have understood the things like the switches and the leverage you have to get people to do things, because a lot of times consultants come in and tell you what you already know."*
>
> (**Voorhees** – Senior manager)

Engagement strategy

Aim: full engagement of every stakeholder

Finding: mixed engagement – sometimes overridden by senior management and Trust communications

Boundary spanners / knowledge brokers

- 2-year project mgmt role (18 months prior to stage 1 move)
- Seconded from Clinical divisions
- Control flow of information and boundary between project team and clinical divisions
- Engagement solely relies on effectiveness of brokers

Executive Team

New Hospital Development Team

Broker   Broker   Broker   Broker

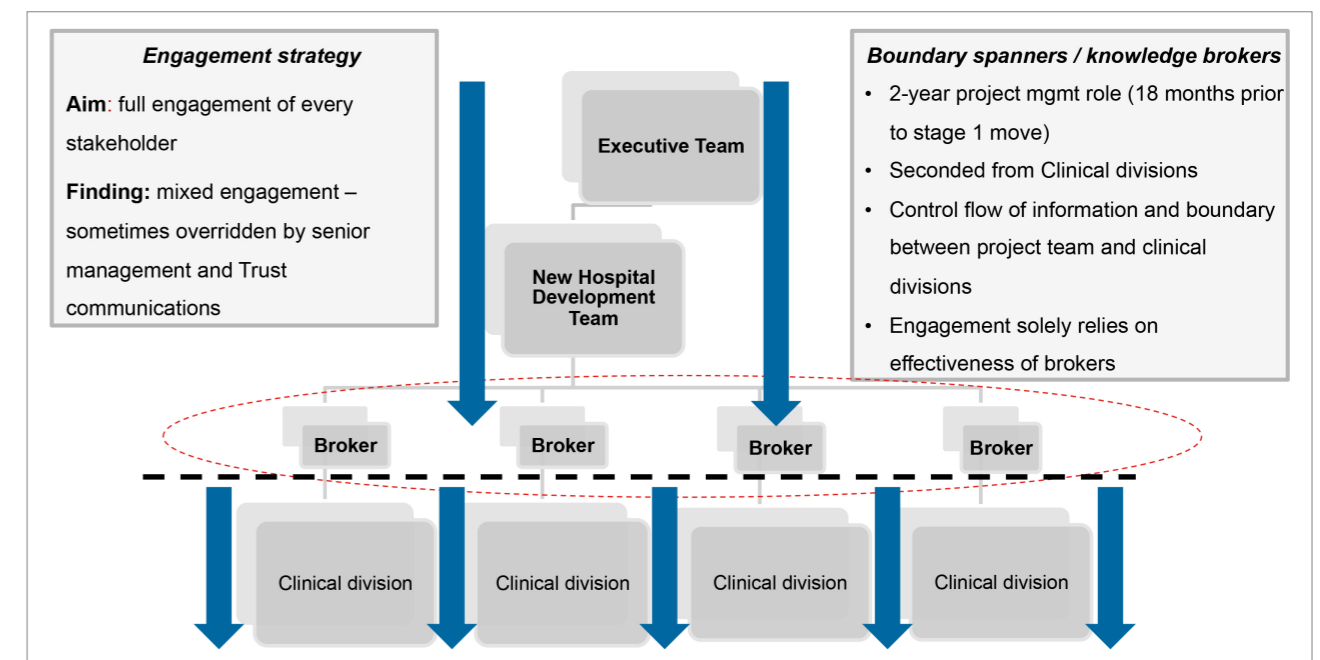Clinical division   Clinical division   Clinical division   Clinical division

Figure 2, Engagement strategy and use of change agents at Pernbury, UK.

These agents used their process skills to facilitate change at a local level, introducing smaller operational projects which could be incorporated into the overall programme. For example, they unpacked and redesigned clinical processes and management processes at the frontline level and integrated this into a whole system redesign for the new hospital. They used the management tools which already formed a big part of the organisation's culture to drive change (see figure 3, where 'organisational culture' is represented by the circle).

"The culture of the organisation allowed us to go there. We were an organisation that was used to tools."
(**Voorhees** – Senior manager)

"When you're looking at the change management, the ability to forge ahead with strategy is really all about the culture. You know, somebody once said, culture will eat strategy every time. And I think that's true. So you can have the best strategy, but if you don't have the culture for performance and the belief to execute, I don't think it's going to happen"
(**Voorhees** – Senior manager)

At Royal Jubilee, the external project office acted as the champion of change. Members of the project office sought to empower and motivate frontline staff and all the project managers had a strong personal commitment to the organisation and the changes being made. Members of the project office emerged from the organisation as champions and were selected and nurtured in their project role. As noted above, the strategy for engagement was to make use of frontline staff to drive the change and therefore the project team champions targeted frontline clinical staff, with middle managers expected to buy-in later to the process:

"I think as they move in and function, that the middle managers will buy in. The frontline clinical staff, they were heavily engaged"
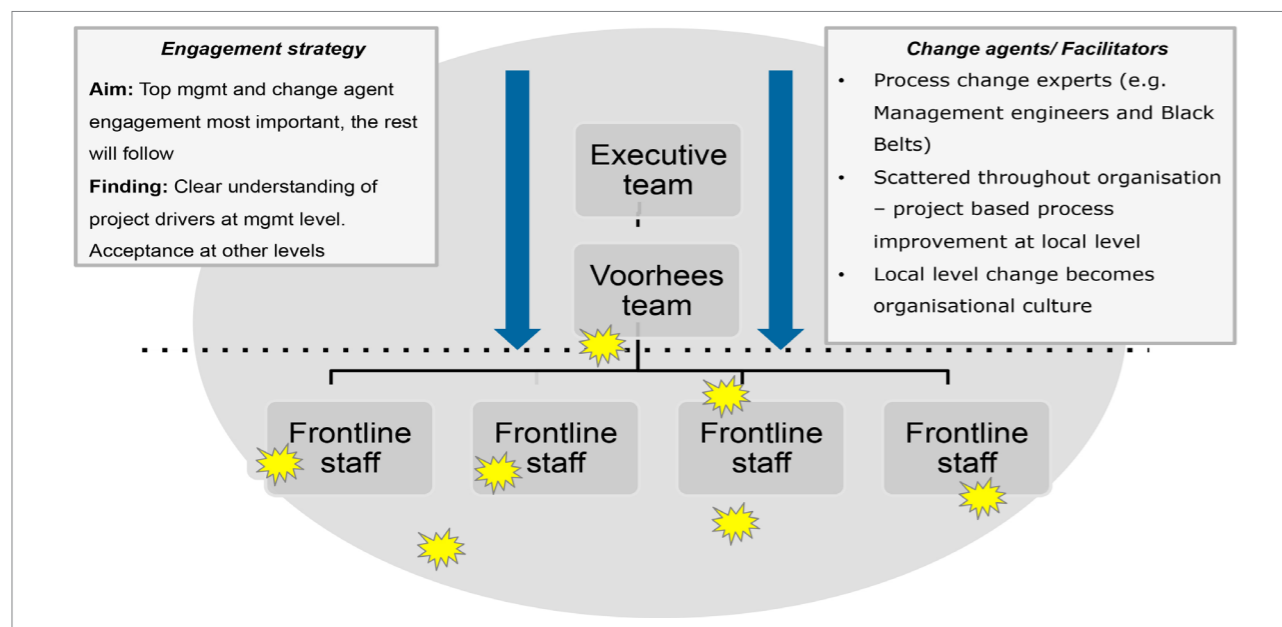(**Royal Jubilee**– consultant)

This strategy was effective in creating enthusiasm and momentum from frontline staff, who became highly engaged, and there was good coherence between the strategy from top and bottom:

"I think that how staff are feeling now is excited. I think a couple of weeks ago they were scared to death."
(**Royal Jubilee** – senior manager/project team)

"And so I'm kind of going wow, we've got a bottom-up and a top-down approach that's also very congruent."
(**Royal Jubilee** – Senior manager/Project team)

Integration of change aspects and adaptation of new processes

It was clearly essential for hospital staff to understand why the new facilities had been designed the way they had, in order to ensure that new processes were successfully adopted.

At Pembury, the project management team focused on the infrastructure and the change was led from the programme board situated in this team. As the design of the new hospital progressed, the Trust became aware of a gap between this group and service delivery changes, the responsibility of the divisional teams. A new 'boundary spanning' divisional project manager role was created to address this gap.

Although the creation of this role may have mitigated some of the problems in coordinating the redesign of work practices and the infrastructure design, some saw this as 'too little too late'. Staff reported that it was only after they had moved into the new building that they truly understood the extent to which they needed to change their operational processes. During the initial period following the move frontline staff and unit leaders had to make many adjustments to the ways they delivered care in the new environment:

"We did think for the first few weeks that we were here, that we would never settle down. We wouldn't be able to adapt to the way that we were working. And we were saying we need more nurses. But when we thought about it we didn't actually need more nurses, we needed to change. So we adapted the way we worked."
(**Pembury** – Frontline staff manager).

The approach at Voorhees was that work process redesign across the organisation was the main driver of infrastructure decisions. The organisation was very proactive in identifying potential work practice changes and linking the aspects of design throughout the organisation. The design of the new facility was only established once the work processes has been decided. They made considerable efforts to pilot and trial all the new processes both in simulations and 'real life' enactment in mockups. The organisation used its own in-house team of management engineers and 'black belts' to meticulously plan the optimum 'move day' scenarios,

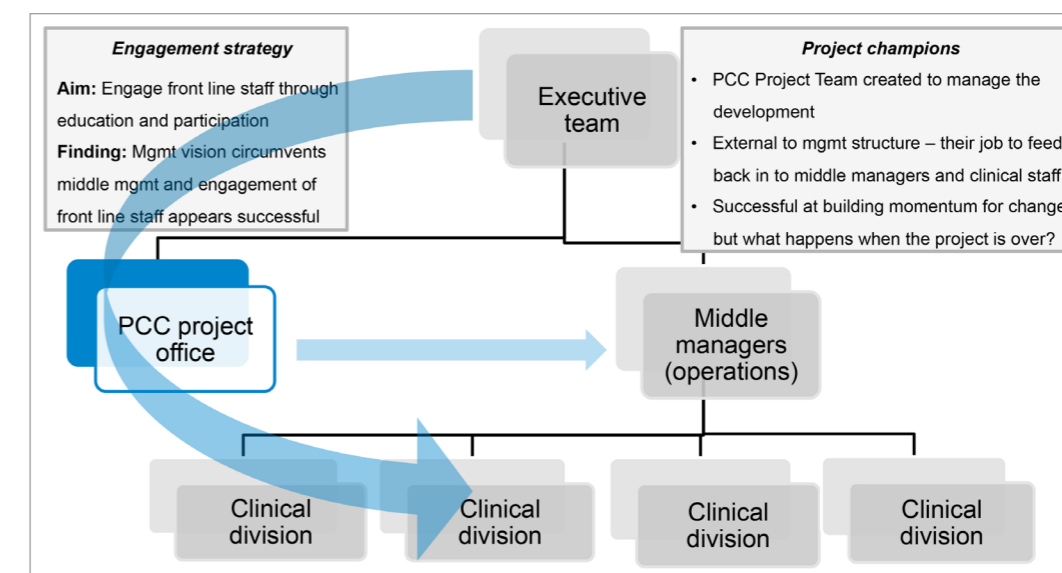Figure 3, Engagement strategy and use of change agents at Virtua, Vorhees Hospital, USA.

Figure 4, Engagement strategy and use of change agents at Royal Jubilee, Canada.

involving simulations and drills with staff and actors as patients. This helped to increase acceptance of the move to the new hospital as it exposed to staff the problems of working with new processes in a suboptimal environment in the old hospital – it was therefore seen as a relief for them to move. This was clearly seen in the mother and baby unit, where nurses simulated how they would deal with care differently in the new building whilst using old processes in their actual work:

"We did change our process for after a baby's born, how we care for the mom and baby together, and we were able to simulate that at the other (old) hospital. I think that was really a good thing, because it's just been accepted… They did a pilot there, but because they couldn't make the infrastructure changes, they couldn't really sustain it over there…but through simulation we were able to get people comfortable with it and it hasn't been that much of an issue here."

(**Voorhees** – Middle manager)

Compared to Pembury, Voorhees interviewees reported fewer instances of resistance to new processes and a good understanding of the necessity of the new environment. This resulted in a smoother transition period and fewer unexpected problems. However, this approach represented a considerable investment in time and money, for example in numerous large-scale drills and simulation activities.

There was also limited flexibility in the infrastructure and service delivery processes once the move had taken place. Only minor adaptation of work processes or tweaking occurred, in comparison to considerable adjustment in the other case studies once the 'reality' of the move became apparent. In some instances employees reported not being able to make changes to work processes which they found we not optimal when faced with higher volume of patients than in simulations.

At Royal Jubilee, the project office was very effective at managing the integration between service redesign and infrastructure aspects of the transition in the planning stages. This resulted in effective training of frontline staff on how to use equipment and they were able to minimise the immediate impact

of the change. Interactive mock-up sessions where employees could practice certain procedures in the new environment were seen as particularly valuable.

However, 2–3 months after the transition (after the project team had begun to disengage from the management of the new facility) it became apparent that there was a gap in understanding the philosophy and reasons behind some aspects of the design and the way in which they were being used. By concentrating decision making on a small number of individuals, a disconnect between the design rationale and practice emerged, which became difficult to resolve.

An example is the way specialist areas were built into each ward space for physiotherapy and rehabilitation treatments. Previously these assessments (e.g. heart patients demonstrating ability to walk up a flight of stairs before discharge) had been carried out in the patient bays or corridors. The rationale behind this addition was that new rehabilitation treatments or assessment techniques, for which there was insufficient space in the old facility, could be carried out with the latest equipment. However, for the first few months, employees continued to try to use old treatment and assessment processes and complained that they did not have space to perform these tasks because they no longer had access to a stairwell to assess heart patients. Whilst the visualisation of how service redesign and the infrastructure changes worked together was clear for the senior management, frontline staff who were still carrying out old processes until the morning of the move, struggled:

"The main staff issues are about [how] we used to be able to do everything differently over there [the old facility] and we don't have the space to do it in the same way and it's not recognizing that we're trying to blow up what we did. It's like how can we do it in the space now, the space is different?"

(**Royal Jubilee** – Frontline manager)

Conclusions and recommendations
During the change management process we observed three very different approaches in our hospitals. Pembury essentially adopted a problem-solving approach, identifying and responding to the myriad of events arising from the constantly

changing NHS environment and modifying their plans accordingly. They demonstrated an ability to be internally critical, recognise their shortcomings and be flexible in resolving these issues. At Voorhees a highly proactive approach was taken, planning for as many contingencies as possible in advance. Staff worked hard to ensure that their decisions were well researched and tested. At Royal Jubilee a fully-integrated approach which used a dedicated group of staff to combine both the infrastructure and work practice aspects of the hospital redesign enabled a highly consistent strategy across the organisation.

Despite the different approaches, all three organisations completed the transition to the new hospital, largely in line with their stated objectives and on time. All three also experienced challenges in the immediate aftermath. Table 3 summarises the advantages and disadvantages of each of the strategies adopted by our case studies.

Case Study	Advantages	Disadvantages
Pembury, UK	· Clear model for communications strategy · Frontline staff receive information from direct superior	· Bottlenecks in information flow (need to prioritise messages) · Relies on skills of brokers
Voorhees, USA	· Wide diffusion of information (fast) · Supported by overall organisational culture	· External pockets of resistance · Information overload
Royal Jubilee, Canada	· Direct engagement of staff · High momentum	· Loss of knowledge when project office detach · Middle management disengagement

Table 3, Impact of different change management strategies.

This study demonstrates that there is no 'one size fits all' template for organisations engaged in this type of complex services and infrastructure change. The decisions and approaches adopted by organisations in managing transformations of this scale are influenced by a variety of contextual factors, all of which have an impact on the acceptance, momentum and facilitation of change. Important factors in reducing the detrimental effects of the transition to the new hospital were:

• The need for continuity of vision and appropriate translation of strategy across the whole organisation. We have discussed the impact of a lack of alignment between levels of engagement and between project teams and clinical staff. We found that where a lack of alignment between different aspects of change developed this had implications for the efficiency of work practices because it was

easier to change a practice than the infrastructure. Organisations therefore need to work hard to ensure transparency in decision-making and rationale behind decisions, as well as the practical knowledge of work processes.

• The retention of change-specific knowledge and the rationale for decisions that were taken needs to be a priority, especially if it has been limited to key individuals. This helps to ensure that future decisions regarding the modification of work practices after the transition continue to support the objectives of the overall organisational strategy. In addition, transferable change management and project management skills which are developed during the transition are useful to the organisation more widely and should be valued as a future investment for the organisation.

• It is important to understand that major work practice redesign and infrastructure change represent two different extremes in transition planning within organisations. Large scale change involving organisational restructuring has been found to create psychological strain in employees due to uncertainty (Bordia et al., 2004), with the redesign of work processes potentially leading to burnout and emotional exhaustion (Ginsberg and Venkatraman, 1995, Dopson et al., 2008). Managers involved in major hospital reconfiguration programmes need to be aware of the unique challenges which each type of change brings and the additional difficulties in doing them simultaneously. Strategic planning, approaches to implementation, and training and education all need to consider the skills and resources associated with this, and ensure that all levels of the organisation understand how infrastructure and service redesign interact in the new configuration. It is important to understand which types of agents (champions to create enthusiasm or change agents to ensure consistent implementation) may be needed at different stages of the change and that these may be different individuals with different skills.

This research has provided an insight into how healthcare organisations plan for and implement large-scale change, for example when organisational and infrastructure change are combined. We have illustrated a variety of strategies for planning this

type of organisational restructuring and evaluated the advantages and disadvantages of each. However, further research is needed to examine the relationship between the intensity and type of planning that is needed prior to major change, compared to the degree of flexibility needed to cope with unexpected internal and external factors. We saw approaches which sought to be very proactive in their planning (Voorhees) and approaches which were more responsive (Pembury). Both allowed for contingency but what was less clear is how the organisations achieved this, and the implications of this for employees. Further research should focus specifically on this issue of flexibility.

Finally, whilst all of our case studies could be argued to have been successful in achieving their immediate objectives, we have not explored the costs of change management in relation to financial, time or other factors. Future work could use appropriate benefits realisation techniques at various post-change points to develop rigorous measures of short and long term success.

Acknowledgements

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Appendix: Data collection and analysis

Data comprised 155 interviews complemented by the analysis of 205 documents (including internal minutes and reports, publicly available reports and research, and media coverage) and field notes from 36 hours of observations (including new and old hospitals tours, informal research observations and impressions, formal mock up days and meeting observations) (see table 4). Data were collected by the research team over two phases for each case study. By using a variety of data sources we were able to gain a holistic picture of the case study and its context from a variety of perspectives (Yin, 2009).

Initial interview participants were selected with the help of a lead contact within each of the organisations. These included key members of senior management (who made strategic decisions about the reconfiguration), middle managers (who were predominantly responsible for the implementation) and frontline staff (who enacted the new processes and worked in the new infrastructure). In phase 1 our focus was on the strategic aims of the reconfiguration, business models used, drivers and historical context. At the second phase (approximately three months after the reconfiguration) our focus was on the immediate impact of the reconfiguration and evaluation. The interviews were conducted by two researchers and analysed by three researchers, providing an opportunity to cross check impressions and interpretations.

Data Source	Pembury (UK)			Royal Jubilee (Canada)		
	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2
Formal interviews:	22	42	28	14	24	25
Observations (hrs):	7	8	10	4	4	3
Documents:	53	63	41	17	10	21

Table 4, Data collection

Interviews were transcribed and analysed by the research team at different levels allowing for constant comparison between the data and the findings (Corbin and Strauss, 2008). Initially, an historical context of each case study was derived. At the first coding stage we used an open coding approach to identify concepts relating to strategies, attitudes and beliefs about organisational reconfiguration planning and impact. These open codes were then compared for similarities and differences to create conceptually similar groupings. We were then able to create more distinct higher order categories addressing the types of challenges which the organisations faced, which we then compared to the original transcripts for verification. These categories were summarised in relation to our theoretical framing and are presented in this report. At each stage of the analysis, members of the research team met to discuss interpretations of the findings, compared analysis and discussed any inconsistencies. There was broad agreement in our interpretations throughout the process and any inconsistencies were addressed by referring back to the original transcripts. □
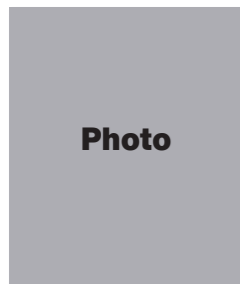
Authors

James Barlow,

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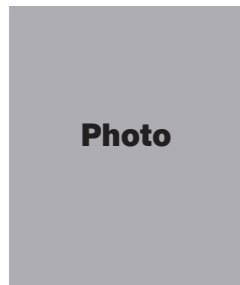
Jane Hendy,

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