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Operationalising Lean in Healthcare: the Impact of Professionalism

Dr Claire F. Lindsay (corresponding author)
Heriot-Watt University, Edinburgh, EH14 4AS
Claire.Lindsay@hw.ac.uk
0131 451 3090

Professor Maneesh Kumar
Cardiff University, Cardiff, CF10 3EU
KumarM8@cardiff.ac.uk
0292 087 5276

Dr Linda Juleff
University College of Estate Management, Reading, RG1 4BS
jull1@ucem.ac.uk
0118 467 2100

Abstract

Lean is endorsed as policy in practice in the UK but the challenges and complexities affecting Lean in healthcare are still to be adequately assessed. Through a qualitative single case study of an NHS organisation implementing Lean, 43 interviews with multi-disciplinary team members involved in Lean were conducted. The progress of Lean is found to be inhibited as medical professionals have failed to engage or provide clinical leadership in supporting the trajectory of Lean. This resulted in limited outcomes, sustainability implications, and failed projects. Lean is challenged by complexity and this is evident in conflicts between professional identity, corresponding status and clinical/managerial relationships. Medical professionals as a group have received a limited focus in papers assessing the progress of Lean in Healthcare from an operational perspective. Going forward, strategies for mitigating the negative impact of this can be developed to support operational managers in the healthcare domain.

Keywords: Lean, healthcare, professionalism, sustainability

Introduction

Twenty three years since healthcare was described by Womack and Jones (1996: 289) as “*a world of queues and disjointed processes*”, Lean application in healthcare has been much debated, yet it has failed to have the same impact as in manufacturing. The reasons for this are uncertain as authors relate to complexity (Mazzocato, et al., 2014) and more recently, the potential impact of professional dynamics (Bortolotti et al., 2018). This paper responds to ongoing calls made in literature, to determine the impact of medical professionals on Lean implementations, through the lens of professionalism.

This continued uncertainty over the progress of Lean in healthcare has resulted in a transition of the research focus from the operational aspects of the work environment (Holden, 2011; Costa and Godinho Filho, 2016) to softer practices including development of employees’ capabilities through employee empowerment and engagement (Drotz and Poksinska, 2014; Matthias and Brown, 2016; Poksinska et al., 2017; Bortolotti et al., 2018). Research has proven the moderating/ mediating effects of soft Lean practices on hard practices and organisational outcomes to sustain benefits from continuous improvement (CI) programs including Lean (Hirzel et al., 2017; Bortolotti et al., 2015, 2018; Hadid and Mansouri, 2014, 2016). Nonetheless, literature to date has had a limited focus on two key aspects of Lean implementation – sustainability of Lean (Costa and Godinho Filho, 2016) and the impact of professionals on the sustainability of Lean.

In healthcare, Lean can be defined as maximising the value of activities and processes for the patient whilst removing waste and improving quality and safety to ensure no harm is caused to the patient in the hospital environment (Jones et al., 2006). Womack and Jones (1996) focused on the supply chain perspective of improvements through Lean, yet the majority of Lean healthcare interventions have often singled out specific departments such as the emergency department (ED) (Ben-Tovim, et al., 2008; Dickson et al., 2009; Holden,

2011; Timmons et al., 2014; Al Owad, et al., 2018). This gives rise to Lean replicating the silo nature of healthcare due to the lack of studies focusing on service wide Lean implementations (Brandão de Souza, 2009; Costa and Godinho Filho, 2016; Lindsay and Kumar, 2016). Further to this, many of these positively reported studies involved healthcare organisations at their early stages of Lean implementation, rather than on results and Lean sustainability over the longer term (Burgess and Radnor, 2012; Mazzocato et al., 2014; Matthias and Brown, 2016). This silo and small project approach observed to date has overly focused on Lean as a tool kit methodology for problem solving rather than considering Lean as a philosophy (Matthias and Buckle, 2016). This exploration of the technical or operational aspects of Lean has neglected to unpick Lean in healthcare fully through a balanced sociotechnical lens (Matthias and Brown, 2016; Bortolotti et al., 2018).

It is the socio-cultural aspects in healthcare which require greater exploration to explicate issues linked to Lean sustainability (Joosten et al., 2009; Waring and Bishop, 2010). Where social aspects have received a focus in Lean, this is to ascertain the impact of Lean operations and culture on staff (Hasle et al., 2012; Longoni et al., 2013; Losonci et al., 2017). The missing piece of the Lean puzzle has been a lack of focus on staff during implementation in order to understand where challenges emerge and subsequently affect Lean sustainability (Losonci et al., 2011; Rich and Piercy, 2013; Taylor et al., 2013; Costa and Godinho Filho, 2016; Al Owad, et al., 2018).

Another gap in the Lean healthcare research is an understanding of sociological factors such as the 'professional identity' perspective which may require different approaches to embed and sustain Lean in healthcare. Established hierarchies and power lying with medical professionals and beyond senior management teams, has been highlighted as challenging Lean and more generally, quality improvement in healthcare (Øvretveit, 2005; Waring and Bishop, 2010). Challenges for Lean due to professionals and the cultures in

healthcare are alluded to by Radnor et al., (2012). More explicitly, Drotz and Poksinska (2014) argued Lean may be regarded as countercultural because of professional identity, healthcare culture and power held by doctors as decision makers. The role of medical staff in policy initiatives has been researched in other contexts such as organizational studies, health policy and medical sociology (Currie et al., 2012; Powell & Davies, 2012; Fitzgerald and McDermott, 2017) but had received little attention in evaluating Lean in healthcare from operations management perspective (Waring and Bishop, 2010). The validity of focusing on this group is further supported given the policy focus on improving patient care in the healthcare environment where strong professional demarcations are in evidence (Gittell et al., 2000; Currie and White, 2012; Powell and Davies, 2012). Limited evidence of research on Lean sustainability in healthcare requires researchers to investigate the reasons for the slow adoption and lack of progress of Lean in healthcare settings (Costa and Godinho Filho, 2016). The statement below from Bortolotti et al (2018) justifies the two objectives of our research proposed below.

Characteristics such as heterogeneity of language across professions, high education level, and other could play a role in explaining the divergent results in manufacturing and healthcare contexts (Bortolotti et al., 2018, 570).

Therefore, this paper explores the engagement of highly skilled medical professionals embedding and sustaining Lean practices in a healthcare setting. This case study research explores through the lens of the professionalism, the role of professional staff in Lean implementations. After identifying the role of these medical professionals, this paper goes on to consider how professional status impacts on long-term sustainability of lean in healthcare? Consequently, the contributions of this paper are multiple. We respond to ongoing calls made over almost a decade (Waring and Bishop, 2010; Drotz and Poksinska, 2014; Stanton et al., 2014; Matthias and Brown, 2016; Bortolotti et al., 2018), to provide an in depth study of

professionalism and how professional identify may be impacting the progress and sustainability of Lean in healthcare. Viewing this through the lens of professionalism adds a novel contribution to the operational literature base by considering sociological impacts on Lean. Seeking the views of multi-disciplinary healthcare teams involved in multiple projects, enables a range of relevant stakeholders views to be gathered in order to assess the progress of Lean in an organisation which had been implementing the methodology for almost a decade. This focus provides a further contribution in the form of an illustration of a longer-term example of Lean implementation which has been lacking to date. The paper concludes by highlighting the importance of engaging medical professionals for long-term Lean sustainability – the Lean programme should be built around medical professionals and not over them.

This paper is structured as follows. The introduction has provided the background to the status and limitations evident in Lean in healthcare on the role of professionals in sustaining Lean. A narrative, hermeneutic literature review, in the next section allows for moving beyond operations management literature into sociology and healthcare literature to critically analyse the role of professionals in implementing and sustaining continuous improvement (CI) initiatives. This is followed by explanation of the research approach and presentation of the case study findings. Discussion and conclusions emerge from this, as do propositions from the case study and literature discussion which also highlight future research directions.

Literature Review

A narrative, hermeneutic literature review, rather than a systematic review focused on a narrow research question (Greenhalgh et al., 2018) has been conducted for deeper

understanding of Lean beyond an operational lens. Recent work in this journal by Costa and Godinho Filho (2016) takes a systematic approach and is acknowledged. The hermeneutic approach allows for critical reflection across a body of work (available through the ProQuest database), on Lean in healthcare, professionalism and NHS improvement. The keywords used for narrative literature review were as follows: Lean/CI AND Healthcare; Lean/CI AND profession*; Lean Healthcare AND Profession*; Lean sustainability AND Healthcare. A hermeneutic review recognises that the work does not seek to be definitive but to understand a developing, ongoing phenomena (Boell and Cecez-Kecmanovic, 2014) which is relevant for Lean which will continue to evolve (Hines et al., 2004). Here, Lean and its sustainability is explored which includes the ‘softer’ socio-aspects of Lean, and identifies where these will conflict with professionalism.

Lean sustainability requires a rethinking from isolated applications of Lean hard practices or bundles towards an integral approach that embraces the whole organization (Rich and Piercy, 2013; Bortolotti et al., 2015; Netland et al., 2015; Costa and Godinho Filho, 2016; Hirzel et al., 2017). The sustainability of Lean is highly impacted by socio-cultural factors (termed as soft factors) by Hadid and Mansouri (2014) and Bortolotti et al., (2015), as the complexity of organizational change requires new ways of working and thinking by both leaders and staff members (Rich and Piercy, 2013; van Dunn and Wilderom, 2016; Hirzel et al., 2017). The inherent characteristics of Lean hard practices or bundles allow the transformation at shop-floor level (Shah and Ward, 2007; Bortolotti et al., 2015) by giving employees empowerment and ownership to embrace CI as part of their daily work routines (through applications of 5S, standard work, TPM, and suggestion schemes) or improving processes that cut across organization boundaries (e.g. conducting kaizen projects, quality circle activities) (Glover et al., 2011; Bortolotti et al., 2018).

The continual pursuit of Lean efficiency gains through applied bundles (Shah and

Ward, 2007) and kaizen project knowledge circulation with minimum delay, promotes cross-functional learning across a firm. This facilitates organization-wide cultural change in mindset and behaviors of shop-floor employees, which is the key aspect for long-term success and sustainability of Lean (Martínez-Jurado et al., 2013). Hines et al., (2004, 998-1000) reiterate this in their own review of Lean in stating; “*Lean should be regarded as more than a set of mechanistic hard tools and techniques and the human dimensions of motivation, empowerment and respect for people are very important*”. Recognised key socio-factors that impact on Lean sustainability are; cultural change (Liker, 2004; Bhamu and Sangwan, 2014; Hadid and Mansouri, 2014; Hirzel et al., 2017), cross-functional teams and communication (Anand et al., 2009; Rich and Piercy, 2013; Bortolotti et al., 2015; Longoni and Cagliano, 2015), employee involvement and empowerment (Imai, 1986; de Menezes, 2012; Singh and Singh, 2013; Lam et al., 2015; Hirzel et al., 2017).

Empowerment has various definitions but Thomas and Velthouse (1990, 666) define empowerment as “*increased intrinsic task motivation*” and this is a key element in soft bundles of Lean. Spear (2004) evaluated that leadership in Lean would involve new ways of working as leaders had a coaching role and were not to fix problems as they would empower their staff to do this. Problem solving and practicality were viewed as valuable skills in managers within improvement initiatives (Ohno, 1988). However, in the healthcare domain, medical professionals have been identified as lacking the training and skills associated with leadership and teamwork which were not acquired when they received clinical training and development (Iedema et al., 2004; Olsen and Neale, 2005). Attempts at empowering other staff groups to take on roles previously the domain of the medical professional, have been blocked by medical professionals (Currie et al., 2012). Clark and Armit (2008) and Fillingham (2008) deduce that health care professionals, have received little training and education in quality improvement methodologies or basic problem-solving abilities. Although

cross-functional team working is evident in the provision of healthcare, issues with medical professionals due to poor communication, traditional hierarchies and internal functional boundaries, can undermine effective working and leadership (Olsen and Neale, 2005; Currie et al., 2012; Rich and Piercy, 2013). These issues in turn affect culture in healthcare organisations as the disparate subcultures within health, clash, and are also impacted by external influences such as professional bodies and politicians (Klein, 2010). Professional groups appear as ‘cliques’ with their own sub-cultures and this can inhibit and control knowledge and involvement between categories of professionals, even those considered ‘doctors’ (Tasselli, 2015).

Professionalism

The study of professionalism first emerged from the sociological discipline (Freidson, 1999) as sociology originally focused on the science of society and has progressed to understanding the relationships people have with each other and the institutions in which they interact with (BSA, 2018). In theorising professionalism, Freidson (1999, 118) states it is “*taken to represent the occupational control of work, which is logically and empirically distinct from consumer control and managerial control.*” To expand on this definition, professionalism is associated with the adoption of formal codes, the belonging to professional associations as well as those who contribute to education, and the distinct language and jargon which aids autonomy and acts as a barrier to outsiders and even those ‘subordinate’ within the professional group (Johnson, 1972). Freidson (1972) distinguishes medical professionals in particular as having a monopoly over its work, which has been supported historically by the state who has maintained this exalted status (Freidson, 1972, 21-23). Both Freidson (1972) and Johnson (1972) evaluate professionalism is associated with power which supports the maintenance of occupational boundaries.

Medical Sociologists such as Currie et al. (2009) deduce that traditional illustrations of professionalism are very much still in existence and provide an update to the work of Freidson (1972) and Johnson (1972) by defining professionals as; *“characterized by their possession of, and claim to autonomy. They have high degrees of discretion in their work and freedom from external supervision. In essence, professions have autonomy in both the social organization of work, for example, within the division of labour, and also in the technical substance of work, premised on the exclusive control of knowledge”* (Currie et al., 2009, 296).

Professionals' roles in quality improvement initiatives have been assessed by other disciplines. Since 2008, there has been a drive for a professionally led focus on quality as a clear principle of the National Health Service (NHS) (Martin and Learmonth, 2012). Despite this widespread endorsement of medical staff taking a leading role in quality improvement, differing objectives, tensions and conflicts between professionals and managers resulting in inadequate levels of inter-professional co-ordination, collaboration, and knowledge-sharing have been evidenced (Raelin, 1986; Ferlie, et al., 2005; Fitzgerald and McDermott, 2017). Indeed, determining responsibility for quality or involvement in quality initiatives can bring aspects of the management of quality and professionalism on a collision course, notwithstanding the perception that healthcare professionals are reluctant to engage in systemic quality improvement (Davies et al., 2007; Wilkinson, et al., 2011). Despite the demand for professional involvement, it has been illustrated that professionalism and professional status can determine the success or failure of quality initiatives (Robert and Bate, 2008).

Professionalism vs. Lean Management?

The efficiency and improvement agenda is recognised as supporting the rise of the NHS Manager (non-clinical) due to the focus of successive Conservative and New Labour governments in the United Kingdom from the 1980s to 2010 (Granter and Hyde, 2010). This rise brought them into conflict however with professionals who claim to be an unmanaged occupation and this complicates the role of the NHS manager who is trying to manage a profession that will not accept their management (Harrison and Pollitt, 1994). Professionals, in order to maintain their professional status and legitimise their positions, use a range of strategies to defend existing professional boundaries such as retaining control over how they define, sequence, and evaluate their work without the requirement to follow standardised pathways (Currie et al., 2009; Powell and Davies, 2012). This will create problems where communication and coordination between employees and managers is expected in Lean (Monden, 1983; Toussaint, 2009). These characteristics of professionals may be considered as a hindrance to the acceptance and practice of Lean in healthcare, which promotes greater transparency and standardisation for quality improvement and patient safety.

As highlighted by Bortolotti et al (2018) and Matthias and Brown (2016), the healthcare context requires a different approach in comparison to traditional service settings in order to understand the factors affecting Lean and its sustainability. In professional service environments, researchers need to better understand contextual factors, especially when research involves knowledge workers such as medical professionals in healthcare operations, in order to adapt the implementation of any change initiatives including Lean (Rahimnia and Moghadasian, 2010; Lewis and Brown, 2012; Harvey et al., 2016). Limited awareness of the context may result in imposing values and norms that underpin Lean processes, into a setting that can create conflict with existing cultures, resulting in resistance and lower performance as identified in the case of HMRC (Fatma and Karen Moustafa, 2015). Given the

acknowledgement of a limited focus on healthcare professionals within Lean, further focus on this group would enable researchers to begin to identify different approaches to engaging professionals in improvement initiatives.

Research Approach

The focus of this research is on a Scottish Health Board (Health Board 2) in order to understand how Lean is implemented. Focusing on the process of implementation allowed us to identify the emergent theme of the role of professional staff within Lean and then the impact of professional status on longer term sustainability. This case study has been deployed as a single organisational case study but as an embedded case design involving multiple sub units of analysis (involvement in Lean, project, project sustainability, professional roles) (Yin, 2011). Eisenhardt's (1989) case study protocol was used to inform the study and all thematic data analysis was guided by the approach of Charmaz (2012), which included case study and reflective notes emergent and updated throughout the project.

The sampling approach was initial sampling (based on people, places of implementation and Lean projects for the pilot study, see Charmaz, 2012) in order to identify those staff facilitating Lean and/or involved in implementing Lean in their services within Health Board 2 (HB2). Staff had to have past or present experience in Lean projects in order to participate in the research project. Requests for interviews were sent to departments who had been/were at the time of research involved in Lean implementation, and cascaded to staff of all grades. Staff had to opt in and contact the researcher by email to arrange this. As healthcare is delivered and organised in multi-disciplinary teams (MDT), staff of all grades were interviewed as this would support assessment of Lean implementation, project progression and sustainability. Although initially a multi-level staff opinion was sought,

quickly research progressed into theoretical sampling as advocated by Charmaz (2012) where a greater numbers of medical professionals were targeted for interview given the views of other members of the MDTs. In total, 43 members of staff were interviewed by the lead researcher (NHS leaders, including those at executive level (e.g. chief executive, executive and non-executive directors and clinical directors), non-clinical managers (Lean Leads, service operations managers, and human resources managers) and front-line staff (nurses, consultant grade medical staff (known in the UK as a consultant) and administrators). Clinical directors hold dual roles as managers and medical consultants so therefore are listed under consultants. Table 1 provides details of interviewees and codes attributed to their responses in reporting qualitative data. As no research data will be entirely free of bias (Greenhalgh et al., 2018), the interview topic guide was standardised and the interviewer was unaware of the specific role of each participant’s involvement in Lean until the interview itself so to avoid any preconceptions which could lead to bias and leading questions (Pannucci and Wilkins, 2010). The topic guide for the semi-structured interviews (see Appendix 1) included what participants understood Lean to be, how they were involved, the implementation process (benefits and challenges), the outcomes from the project and if these were sustained.

Role	Number	Interview code
Lean Improvement Team	8	QI
Service Operations Manager	5	OM
Administrators	6	AD
Consultant (Medical Staff)	13	CT
Executive	2	EXEC
Nursing Staff	6	N
Human Resources	3	HR
Total	43	

Analysis

All interviews were transcribed verbatim immediately after their conduct so to facilitate the iterative cycle of interviews, analysis and responsiveness to data to develop theoretical sampling (Charmaz, 2012). The interview transcript was emailed to interviewees before starting the analysis to avoid any misrepresentation of the viewpoints of interviewees. The lead author led the analysis for this study in the transcription, reading/rereading and inductively coding the interview data. Three rounds of coding were applied to the data in this project. The first round involved line by line coding as advocated by Glaser (1992) and involved naming and providing a common name for the data concepts. As in vivo respondent codes were applied to data, this was to be refined in round two where categories are integrated and relationships between categories are becoming apparent (Charmaz, 2012). In round three, further refinement of properties and dimensions of the data now results in saturation where no new data provides any new insights and sets the focus of the research (Charmaz, 2012). These three rounds are labelled to provide first, second and aggregate order concepts and are shown in Table 2 below. The transcripts and coding were shared across the research team to ensure clarity of approach, refinement of categories and identification of reaching saturation. The consistency of respondent driven themes emerging from the data set supported saturation and also the validity and relevance of the analysis. Initially the focus was on those 'leading Lean implementations' such as the Lean team but quickly it emerged the team held a facilitation role and medical staff were expected to take on ownership of Lean in their services. As the sample of respondents included clinical and non-clinical staff, data illustrated respondents' challenges with medical professionals as part of challenges facing Lean, hence the emergence of the research focus on this group to understand their impact on Lean implementations. Following this analysis, the enfolding of literature was undertaken in

order to determine if the findings were conflicted or similar to those in the existing literature base (Eisenhardt, 1989).

Table 2: Qualitative Data Structure and aggregate concepts

Aggregate Concept	2nd Order Concept	First Order Concept
<i>Professional Role</i>	<i>Engagement</i>	Engagement with all groups Commitment towards Kaizen workshop attendance varied Perception of benefits from Kaizen varied Different levels of engagement demonstrated: resistance, enthusiastic supporter, game playing Medical leadership team engagement varied Part of multi-disciplinary team (MDT)
	<i>Empowerment</i>	Support other voices to be heard Support others to make changes Flattening hierarchies
	<i>Impact</i>	Breakdown silos Relationships and knowledge sharing across traditional boundaries Genuine successes Failed and stalled projects Sustainability issues
<i>Professionalism impacting on sustainability</i>	<i>Identity as a Medical Professional</i>	Autonomy and Power Own agendas 'Special' Historical dominance
	<i>Managing Professionals</i>	Arrogance and problematic to manage Obstructive to change Difficult behaviors advertised in Lean resistance Poor professional-managerial relationships
	<i>Silos and Accountability</i>	Resistance to Lean for hierarchy and silos to be maintained Service management cannot make medical staff accountable Own clinical leadership teams cannot make medical staff accountable

Context of Lean process in HB2

HB2 at the commencement of the research project had been implementing Lean for almost seven years and were one of the first public sector organisations in Scotland to embark on widespread Lean transformation. The promise of Lean from the Executive was based on empowering staff in improvement and this underpinned the approach to Lean in the organisation. A dedicated Lean Team who all previously worked across HB2 in operational

and organisational development roles, viewed themselves as facilitators to Lean, with outcomes derived from service based staff. Over 70 Lean projects were undertaken, linked to strategic priorities either from HB2 or from wider Scottish Government priorities (e.g. improving cancer treatment times). Full pathway projects including those extending beyond hospital boundaries into projects with social work and third sector, received a heavy focus.

Kaizen events, held over five days, involved multi-disciplinary teams within clinical pathways coming together to improve process flow, through the removal of waste and focusing on greater value adding steps. These kaizen events, facilitated by a member of the Lean team (Lean leads who are noted as QI in Table 1) included teams of front line staff of all grades. Senior medical staff were encouraged to attend as their clinical leadership roles in service were recognised. Pre-work was undertaken as Lean leads used interviews to unpick where problems and cultural issues existed within services. These interviews were used alongside metric data available at the outset of the project which was limited without contextual understanding. Post-Kaizen, staff worked on an action plan to deliver outcomes and the final report out would be held approximately 30-60 days post-kaizen. Projects would then be handed over to service operations management teams to sustain and build upon Lean improvements. Although service managers ultimately had responsibility for the projects, many of the outcomes had been derived by the empowerment and ownership of front line staff. Project benefits included ensuring safe and equitable access to treatment, reduction in treatment times and increased capacity within service provision. Qualitative benefits were reported such as improved working between and across services and improved departmental relationships and communication.

Determining the professional role

Engaging multi-disciplinary teams is viewed as the key to success and sustainability of Lean projects in HB2. In determining the role of the medical professional, this was assessed not only by the professionals themselves, but also through the various other staff groups who were interviewed as part of this research. In determining their professional roles in Lean, three main areas were emergent from the data: professionals' support in the empowerment of other staff groups, professionals' engagement with Lean, and the impact they had on Lean improvement initiatives.

Empowerment

The Lean Team in HB2 facilitated Lean improvement but it was made clear to the services that there had to be ownership at service level and multi-disciplinary teams would be involved in generating and sustaining any outcomes from Lean. Medical professionals are viewed as an integral part of the service, due to their specialist knowledge and role within services, so they have a key role in Lean and also in supporting other staff in improvement. One medical professional in particular recognised their role in empowering staff during the kaizen when others thought that attending would be a waste of time.

I maybe had one or two on the side comments from consultants about 'it's a waste of time, it'll never achieve anything.' Then you could see the light coming on and maybe because I, and it's not immodest, but I maybe I was there to say 'come on, give it a chance and listen and see what you know Abby in Admin has to say about something, let's just hear it out' (CT3).

Administrators considered themselves at the bottom of the healthcare hierarchy and appreciated being given the chance to use their voice to contribute to service improvement.

It's the first time that has happened in all the years that I've worked, to be able to stand up and voice my opinion and for people...listening to the person who is doing the job and incorporating what they are saying. They actually listened to what someone who was at the bottom of the food chain was saying, rather than someone at the top of the chain (AD4).

These qualitative benefits of Lean were recognised by other medical staff who were encouraged to be in attendance at kaizen. Those staff who engaged in the process welcomed the chance for other staff groups to be empowered to contribute. These events were viewed as bringing all staff members' together, thus flattening traditional medical hierarchies with improvement generated and sustained from staff members ranging from support staff, administrative, nursing and medical professionals.

There was the opportunity for everybody's views to be gathered, you know because in medicine there are hierarchies and so it was a good opportunity to flatten those hierarchies and bring people at the grass roots/coal face, get them to come in and they could be heard in an environment where they knew they were going to be heard and not squidged by the bossy senior consultants (CT5).

Engagement

Engagement was consistently discussed by participants and medical professionals' engagement was evaluated. Further to this, out of 13 medical professionals interviewed, only five could be identified as enthusiastic supporters of Lean and they had been involved in

multiple projects. Those medical professionals supporting Lean viewed the methodology as simplistic as it offered huge potential in improving care. However, it was also recognised that peers may perceive Lean as a management technique and this impacted clinical engagement.

Yes, I think most people see it as a management technique and it is something that management tell people to do and its related to being....people don't really know its related to clinical care but they don't actually see the impact it can have on clinical care and how actually a lot of it is about making working lives better (CT9).

Services involved in Lean often showed splits in engagement from medical staff. This was obvious to other staff groups such as administrators, who reflected on the divergent views across the medical professionals they had viewed within the Lean implementation. These professionals assessed this lack of interest from their peers detailing that change in the NHS system was assumed to be impossible. This was despite the Executive assertion that Lean was being implemented to support staff in HB2 in being empowered to make these changes;

They were very, very divided and some people did want to do it and others wouldn't and they were picking at how things wouldn't work and how things do work (AD2).

I think there is a lot of disinterest...I think there is a lot, not apathy but it is almost the assumption that change is impossible and so, let's not even try (CT11).

Engagement of medical professionals was evident in terms of attendance but there were both positive and negative illustrations provided. Administrative staff in one general surgery

service often referred to key members of the medical staff as engaging in Lean, through their attendance at kaizen and contributions to service improvement. When these staff were interviewed, they were somewhat negative in their own discussions of Lean and outcomes generated, suggesting a degree of ‘game playing’ (Waring and Bishop, 2010).

I think the majority were a bit like me; they couldn't be bothered with it... I don't think anything major happened except for a good psychological exercise (CT1).

Not all medical professional contributions were positive and this impacted the experience of kaizen for other stakeholders as one Lean lead recalled.

I had an event last week where everything was going quite well in the morning, we stopped for lunch and during lunch, a consultant came in who hadn't been due to attend, who had just pitched up and she sucked the life out of the group in the afternoon and the whole dynamic changed, it was unbelievable, and everyone just sort of run out of steam (Q15).

Feedback about ‘those disrupting events’ was noted on event evaluation forms. Many attendees had been lower graded ancillary staff and their complaints were about how a senior medical professional could come in, be disruptive by questioning and being dismissive about what they had been working on, despite playing no part in the earlier session.

Engagement affecting impact

To date, although the organisation has achieved some genuine successes through Lean, there have been failed and stalled projects as well as sustainability issues. This has been attributed

to a lack of medical professional engagement as medical leadership is viewed as essential in supporting Lean and achieving meaningful and sustainable outcomes. Medical staff simply acknowledged that their peers did not engage in Lean events. One Clinical Director enthusiastically supported Lean improvement in HB2 and had been involved in multiple projects due to the multi-disciplinary linkages of his speciality. He has passionately endorsed service improvement through Lean as he feels the methodology is easy to grasp, leads to lasting change and provides extensive benefits for patient care. Despite this obvious support, he was dismayed by the failure of his peers to engage, noting a limited impact through improvement when the 'critical mass group' for this driving improvement are absent.

Whether again that comes back to the critical mass group...it is really important that you have the people who can change things in the room...In Orthopaedics' Lean, there were no Ortho pods there, no Orthopaedic surgeons, not that I ever saw. They had the charge nurse and the clinical nurse manager but that engagement or lack of it as such, yes, how do you get round that? (CT10).

Multiple interviewees referenced this project due to those working across multi-disciplinary areas as Lean projects had been pathway focused and extended into sub-disciplines which fed into these pathways. A Lean lead familiar with the project also discussed the lack of engagement from Orthopaedic surgeons, resulting in actions and outcomes not being progressed.

...since we have been in site A, the Orthopaedic surgeons have not come to anything and Orthopaedics is one of the pilot sites... you know, I said right at the start, if we don't have surgical engagement then there is absolutely no point...we've closed off some actions because they've gone nowhere and there is

no point in asking 'how's this going, how's this going?' because they are not going to do it, they are not interested in it...it was a good idea at the time, [now] just close it off (QI6).

Impact

A small group of medical consulting staff who were interviewed had been involved in multiple projects and they assessed the impact of Lean. Typical Lean improvements were evident in HB2 including reduction in treatment times, bed days saved, improvements in cancer and stroke pathways. Staff however, often acknowledged the softer aspects of Lean such as improved relationships, and knowledge sharing which spreads beyond traditional professional boundaries which in turn supported positive outcomes from Lean.

I've been at various Lean events; I mean Lean [here] has been around for a few years now. I already had experience of Lean from just going to events and I absolutely see the value and the benefits of these things. The seven day working [kaizen] event, I thought was very useful and very interesting and I think part of that was because we were definitely crossing and cross cultivating so people were telling you...there were people from social care, people from the hospital...so there was definitely stuff that people were learning about other things (CT13).

Mental health pathways which have been flagged as a key priority for improving access to services and support for people in need, received an early focus in HB2. Mixed results were evident here. There was engagement by operational managers who had continued to implement Lean in the service, showing ownership by the Lean team which was desired by HB2.

There are a couple of operation managers who have taken things forward themselves who had initially, for example mental health, where they had a project in mental health a couple of years ago where they were successful and they started doing their own kaizens and things which has been quite useful and that's the way it's should be as staff should get a taste for it and then want to do it themselves so that builds internal capacity (Q14).

Despite operations engagement however, mental health pathways were regarded by Lean leads who had worked across that service as being much more challenging in terms of engaging medical professionals. Lean in this pathway was aimed at reducing unacceptable waiting times so as to ensure better access to mental health services. This operational outcome needed support from both operational and medical staff. However, a lack of service ownership from the medical professionals meant the Lean lead was working to deliver improvement outcomes, rather than provide support in a facilitation role. Professional demarcations were exhibited by mental health professionals with respect to their self-perceived identity within their own discipline and also the impact of autonomous working on their professional practices.

I think their longest waiting time was 4 years which was just horrific. You know, time analysis was showing that they spent roughly 30% of their time in face-to-face contact. When this came out [we asked] 'when do you run clinics?' [The response] 'We don't run a clinic, that's a medical model' and they are very anti-medical models. They fit their patients in around their meetings and their supervision time (Q11).

Despite operational success elsewhere in the pathway, ultimately, sustainability was not evident in professionally owned areas in mental health.

Professional Status

In ascertaining the role of the professional in Lean, although there are clear expectations of professional having a leading role in engaging and empowering staff to have a positive impact on Lean, in reality, only a few key professionals have been highlighted as doing so. What has started to emerge from the discussion of professional roles is the impact of professional status on Lean and subsequent sustainability. Autonomy, power and status as a professional were associated with medical professionalism and recognised by peers. Human Resources (HR) Managers confirmed they had no involvement in Lean but they, through their own roles, recognised the impact of a professional and corresponding autonomy.

I think that sometimes people are...they are professionals and perhaps they regard professionalism as 'being able to do what you want' (CT10).

Again, in my view but I think you'll find that some medical staff enjoy the freedom that they feel they've got and would not like to see that diluted in any way (HR3).

Managing consultants

Noting the lack of medical consultant engagement in Lean, another service manager attributed this to existing professional silos. These silos impact the management of service delivery and overall accountability as professionals through their status, are managed by other professionals, not the operational managers who manage the service.

My personal view is, until we break down that [professionalism] silo and we have people managing the service, including the medical staff, we will always run into cultural problems and professional problems in terms of how we deliver a service (OM5).

As with mental health pathways, many of the service based Lean initiatives were driven by operational managers, rather than medical professionals, despite their leading role to play in delivering Lean. Illustrations were provided of medical consultants fighting hard to maintain the status quo of their power and hierarchy, through resistance to Lean, and this was attributed to their identity as a professional. In a bid to improve Gynaecological processes in managing patient notes and the flow of information, a project to introduce speech recognition technology was facilitated by the Lean team and this directly impacted and required medical professional engagement. Lean leads were explicit about the difficult behaviours of this group which were advertised to other staff in this project which was on-going project at the time of interviewing.

...at the moment with the Gynae team and the consultants because...no, not all the consultants because a few of them are very keen and a few of them are dead against it. Dead against Lean itself. So it's been very difficult to engage and see them and it's really one of the senior consultants who is leading the charge at this, at this kind of view and it's...he's brought a few of them with him...When they do respond to emails they respond to everyone, so their negative comments are not only directed at me but directed at everyone else which brings along...which advertises that kind of behaviour is almost acceptable and some other more junior staff might kind of follow their lead I think (Q14).

Silos impacting accountability

In discussing behaviours, these were also related to the impact of healthcare specialisms. In healthcare, ‘specialities’ are noted as being particularly protective of their silos. Powell and Davies (2012) evidenced intra-professional demarcations and tensions in resistance to improvement where specialities interacted during improvement initiatives with the preference for silo working. The provision of out of hours care has been a challenge across the UK, with increased hospital attendances due to a lack of general practitioner cover during evenings and weekends (Segdhi, 2013; nhs.england, 2018). Naturally, this was to be an area of focus for the on-going Lean work and would involve all specialities. These intra-professional demarcations and the resistance to Lean became evident in a project where junior medical professionals of all specialities would be covering out of hours care. General surgery trainees were already on board, however resistance from the ‘specialities’ such as Dermatology and Cardiology was evident as senior medical staff appealed to their professional bodies to support and advocate that this service improvement and accountability for out of hours care was unacceptable.

Looking back at it, in the middle of it, everyone was going as far as they possibly could to resist any change. Absolutely as I say to the point where they were involving people from all over the country to try and help support their arguments against us for what we were trying to do. So some of the seniors had written...we had people writing to national organisations. I mean it actually ended up getting discussed in London at national meetings of the College of Physicians, HB2, I mean it was...the resistance was so strong. Oh yes, all the professional bodies, so British Society of Dermatology, the British Society of Cardiology, the European Society of Cardiology...so people were going and letters were coming in with the headings on saying ‘we believe this is happening and we do not support this’ so people are very resourceful and going to every avenue that they could do to try and change it (CT13).

Intra-professional demarcations continued to be assessed in HB2 by stakeholders involved in Lean as ‘perfect specialities’ were discussed who perceived there to be no need for improvement interventions. This in turn affected the spread and sustainability of Lean. Lean leads were at a loss as to how to engage these groups.

There are certain specialties where they don't even participate, because 'they are perfect' and they are renowned for it and my colleagues have had the same thing in different projects. You know, how do you get them engaged? Sometimes you can't, can't make them (Q17).

Professional and managerial relationships

Discussion of problematic senior medical professionals continued as staff members tried to unpick why these issues were evident. Critiques of poor professional and managerial relationships attributed to the view of management held by the medical staff. This in turn impacted engagement in Lean, especially where Lean and the financial support for improvement, was perceived to be a management initiative and a waste of time.

They think Lean is a waste of money or a waste of spending money on us...a management initiative, but a lot of the consultants are very sceptical and wary of their own management teams so it's quite difficult for them to be 'in' (Q14).

This was echoed by senior medical staff who often raised issues of poor relationships with managers when they were discussing challenges in their services and views on improvement. One consultant succinctly summed up his view of clinical-managerial relationships;

I think as clinicians we feel that management don't listen to what we want (CT6).

It was evident there was a view that identity, tied to the professional role, was important in gaining credibility and support for what was being achieved in the healthcare environment (Fitzgerald & Ferlie, 2000; Powell & Davies, 2012; Fitzgerald, 2016; Fitzgerald & McDermott, 2017). The professional bonds, informed by training, knowledge and solidified by recognition of expertise, determined their status as a medical consultant. Service operations managers in the NHS were not viewed to hold a comparable status. These managers were viewed as administrators, not professionals, who lacked the necessary qualifications or status for their role with their work impacted by the politics of healthcare delivery;

I think managing doctors is bloody hard because they can always stick their nose in the air and say 'where is your medical degree? You are just some jumped-up nurse, you know!', which is a terrible thing to say as you are all doing the same thing...there can be an arrogance amongst doctors that makes them very difficult to manage (CT8).

There isn't a lot of management around here, there seems to be a lot of administration and sort of seeking to deliver a political mandate...most of the healthcare managers you see here, they've never seemed to have worked anywhere else. Most of them don't seem to have any professional management qualifications, so I'm quite alarmed by that...my line is I would rather we were managed by John Lewis or Amazon (CT4).

Other respondents were at a loss to explain why the management of this group was ineffective and impacting on Lean. One administrator, responsible for delivering 130 action points from successful and sustained Lean pathway implementations in one service, provided illustrations of difficulties of poor relationships and communication between medical consultants and their line manager who is also a medical professional.

I mean all doctors feel if they are the person, they are all very important and they are, we know they are but...they don't see past their own ideas and if it is something they do not want to do then they are like 'no, no, no'. The clinical director for us is very nice. Very nice man and I get on really well with him but there are issues with him and other consultants and there is a lack of communication throughout the department...it starts at the top and works its way round and I would say the other teams work pretty well together but not the medical staff (ADI).

In assessing the impact of professionalism, multiple areas emerged for consideration. It was clear that the identity of a professional had an impact on improvement through Lean and therefore sustainability of Lean, but also more widely in their interactions with other members of the multi-disciplinary team. Even within teams, cliques were evident (Tasselli, 2015) and the identity of a medical professional enabled these professionals to adopt strategies to protect their autonomy and power. They fought to maintain organisational silos through their specialties, professional bodies and to block attempts at engaging in improvement through Lean. In managing the professionals within Lean, they were viewed as a profession that was managed by their peers but there was also conflict here, as well as with operational management, due to the lack of professional respect.

Discussion

Researchers emphasized the need for better understanding of the social dimensions of the Lean socio-technical system (Rich and Piercy, 2013; Bortolotti et al., 2018) in order to understand the system dysfunctions in healthcare and how these impact on effective learning and employee engagement promoted by true Lean implementation. Our study builds on conclusions drawn from recent Lean healthcare studies that emphasized understanding the role of key-power holders including consultants and senior doctors (Rich and Piercy, 2013; Drotz and Poksinska, 2014), the heterogeneity of professional languages resulting in professional demarcation (Matthias and Brown, 2016; Bortolotti et al., 2018), leadership roles and motivational factors impacting on Lean sustainability in healthcare (Costa and Godinho Filho, 2016; Poksinska et al., 2017).

Roles of professional staff in Lean implementations

The first contribution of our paper is in answering calls for a greater focus on the medical professionals in Lean implementations (Drotz and Poksinska, 2014; Bortolotti et al., 2018). Past research in operations management has provided a lack of focus on this group, despite other disciplinary areas covering this and alluding to issues (Fillingham, 2008; Radnor, et al., 2012;) or being explicit about the need to focus on this group and their roles in Lean (Waring and Bishop, 2010; Rich and Piercy, 2013; Drotz and Poksinska, 2014; Stanton et al., 2014; Matthias and Brown, 2016). Through identifying the service wide approach to Lean in HB2 we found that professionals held various roles in Lean.

This question was answered in our evidencing that although there was a clear and expected role of medical professionals in Lean improvement as part of multi-disciplinary teams (Mintzberg, 2011; Martinez-Jurado, et al., 2013) few incidences of this were illustrated

as this was the exception, not the rule. The assessment of the roles of medical professionals in Lean was identified through their engagement in kaizen events and through this, their interactions with other members of the multi-disciplinary team (MDT). Senior medical staff who engaged through kaizen events, had a positive role in empowering lower-graded staff for improvement which is recognised in Lean (Singh and Singh, 2013; Lam et al., 2015; Hirzel et al., 2017) and supports respect for people and culture change (Liker, 2004; Hadid and Mansouri, 2014; Bortolotti et al., 2018). In some instances, senior medical staff took the role of a ‘hybrid manager’ to lead improvement projects. Similar to findings reported in the literature (Currie et al., 2012; Currie and White, 2012; Fitzgerald et al., 2013; Fitzgerald and McDermott, 2017), those projects had more buy-in from team members and were successful in achieving the outcomes set at the outset. This was almost argued for, rather than the default in healthcare as noted by CT3.

In considering senior medical staff engagement, three roles were identified within Lean initiatives in HB2 - ‘the resistance’ composed of medical professionals who were against Lean, did not engage and advertised their views to junior staff; ‘enthusiastic supporters’ who engaged in activities related to Lean improvement and were often present and supporting cross-disciplinary projects; and through cross-analysis of multi-disciplinary team accounts, the emergence of ‘game players’ - medical professionals providing the illusion of participation and engagement in Lean as viewed by others, but then discussing their lack of engagement, which may impact on sustainability in the longer term (Mintzberg, 2011; Rich and Piercy, 2013). Waring and Bishop (2010) and Drotz and Poksinska (2014) have also identified game players and as such, identifying the roles held by medical staff in Lean who do not show complete engagement, challenges expectations more generally of healthcare improvement being professionally led (Fitzgerald and Ferlie, 2000; Davies et al., 2007; Wilkinson et al., 2011; Powell and Davies, 2012; Fitzgerald, 2016; Fitzgerald and

McDermott, 2017). In assessing the roles of medical professionals, we provide a greater understanding through clear evidence of the operational challenges Lean faces in the implementation period (Losonci, et al., 2011; Taylor et al., 2013). This results in our first proposition:

Proposition 1: Senior medical staff, taking the role of hybrid manager, are a key enabler for engaging staff and supporting Lean success.

Professional Status Impacting on Sustainability of Lean

Our second contribution comes from the evaluation of medical professionals through the lens of professionalism which is more commonly applied in sociological studies.

In assessing the roles of medical staff in Lean, evidence of their professional identity being used to subvert engagement was emergent and in consensus with recent publications (Matthias and Brown, 2016; Bortolotti et al., 2018). Therefore this allowed for consideration of the second research question in determining the impact of professional status on sustainability. Despite these efforts to engage all staff including the medical professionals, there was a clear impact of professional status on Lean demonstrating that their support or otherwise influenced its' trajectory in HB2. Although this has been inferred elsewhere in success stories of Lean implementation (Furman and Caplan, 2006; Fillingham, 2008), this was evidenced here with non-engagement attributed to the identity of a professional with corresponding autonomy, determination of specialised work, power and influence (Freidson, 1972; Johnson, 1972; Drotz and Poksinska, 2014). Others demonstrated protectionism over their specialities that were described as 'perfect' and not requiring improvement or not conforming to 'medical models', which highlighted clear intra-professional demarcations (Powell and Davies, 2012; McGivern et al., 2015).

In Lean initiatives, examples were provided by respondents of these medical professionals using their professional status to legitimise their positions and defend existing professional boundaries (Currie et al., 2009; Powell and Davies, 2012). This resulted in subversion of Lean projects, reduced improvement outcomes and areas where Lean initiatives would not be progressed due to a lack of medical staff engagement, all of which impact the sustainability of Lean in HB2. Lean has been criticised for its patchy adoption (Radnor et al., 2013), small project focus (Radnor et al., 2012) as well as a lack of long-term sustainability (Mazzocato, et al., 2014), but here illustrations of the lack of engagement from professionals are provided in HB2. In doing so, we provide clear evidence of the impact of professional status on the spread and sustainability of Lean, which can start to explain the gulf in Lean application in healthcare in comparison to other industries. HB2 have moved beyond the initial two – three years of Lean in comparison to early published examples of Lean healthcare (Ben-Tovim et al., 2008; Fillingham, 2008), but it is clear that professionalism as a socio-cultural factor in Lean implementations (Hadid and Mansouri, 2014; Bortolotti et al., 2015) is negatively impacting on sustainability in HB2.

Healthcare improvement is recognised as driven by senior and non-clinical service operations managers (McBride and Mustchin, 2013) and this was evident in HB2. Human resources staff were interviewed but admitted they had no involvement in Lean. Consequently, there has to be a different approach to Lean in engaging medical professionals from the outset in implementing Lean given the relationship difficulties identified and the value placed on professional identity. This leads to our second proposition.

Proposition 2: Professional Identity with resulting intra-professional demarcations can impede the long-term sustainability of Lean in healthcare environment.

Contribution to Practice

Poor relationships and communication were evident between medical professionals and management teams which had an impact on engagement and this has been recognised in studies of the NHS more generally (Davies and Harrison, 2003; Martin and Learmonth, 2012; McGivern et al., 2015). Crucially pathway projects need to be supported by multi-disciplinary teams but poor relationships can impact the delivery of care due to a lack of communication and coordination (Raelin, 1986; Ferlie et al., 2005; Fitzgerald & McDermott, 2017). Lean was being used in HB2 to improve coordination with both positive and negative examples of relationships and communication potentially impacting patient care.

Tension and clashes evidenced between professionals and managers during Lean implementations in HB2, further justifies the need for shared leadership between professionals and managers for the effective management of improvement programmes (Fitzgerald et al., 2013). This would thereby result in improved performance (Fernandez, Cho, & Perry, 2010). There needs to be further intervention to enable jointly led improvement initiatives (e.g. Lean) by senior managers and medical professionals, which would better support the translation of policy initiatives into practice (Fitzgerald et al., 2013). Supporting relationship building between medical professionals and managers would be of benefit through organisational development (OD) efforts involving human resources and this is recommended for all staff in Lean implementations (Alagaraja, 2013). Human resources recognised issues with professionalism but had admitted no involvement in Lean so there is potential for this to change. Greater focus on behaviours and relationships through OD initiatives supporting change through Lean, may create the basic stability needed for Lean (Ballè and Régnier, 2007) and also address and support transition of the roles of professionals identified earlier, from the resistance to enthusiastic supporters. Clear professional leads for

Lean may also negate ‘game playing’ and result in improved outcomes and long-term sustainability in healthcare. This results in a third proposition:

Proposition 3: An increased focus on organisational development initiatives between medical professionals and management teams is required to support relationship building for driving sustainability of Lean.

What has emerged from our case study of continuing Lean implementation is this lack of engagement from medical professionals and negative relationship between clinicians and managers, have not helped in embedding Lean within the DNA of the NHS.

Conclusion

Taylor and Taylor (2009:1325-1326) recognised the benefits of exploring operations practice (which would include Lean) through alternative lenses in order to enrich or to challenge existing assumptions. The lens of professionalism, more commonly applied in the sociological discipline, allows this paper to make a theoretical contribution due to a focus on the role of medical professionals’ in Lean, enabling understanding of the impact of being a professional with corresponding power, autonomy, within a historically supported position. Øvretveit (2005) had previously endorsed focusing on medical professionals roles’ in quality improvement due to power and status within the healthcare domain and this was echoed by Waring and Bishop (2010), focusing specifically on Lean. By evaluating these professionals, more recent calls for greater focus on leadership and culture, especially the impact of key power holders and professional demarcations on Lean, are addressed (Rich and Piercy, 2013; Drotz and Poksinska, 2014; Bortolotti et al., 2018). Illustrations of how professionals’ roles and status impact the trajectory and sustainability of Lean through the case study of HB2 are provided. This focus further supports context dependency, especially in understanding

professional dynamics and knowledge in the provision of professional services (Hartley et al., 2016). In considering Lean in HB2, a much needed example of longer-term implementation of Lean in healthcare has been provided. Mazzocato et al., (2014) proposed how Lean was challenged by complexity and in the case of HB2, we argue this complexity appeared in the form of professional status with corresponding power and intra-professional demarcations acting as a barrier to spreading and sustaining Lean throughout the organisation.

A limitation of our research is this paper is based on a single organisational case study, based in a public hospital in the UK, providing acute care. Whilst this study has provided rich data, this may affect generalisability of our findings across other healthcare institutions including cultural contexts and also private hospitals. Identification of further studies of healthcare facilities implementing Lean over the longer term (10-15 years) may provide successful examples of navigating the issues we have identified.

Implications for future research

Despite this lack of professional engagement in some services, HB2 continued to implement Lean, over a decade after their journey began and successes were driven not just by operational management, but administration (clerical) staff. By giving a voice to lower graded staff such as administrators, we started to identify elements of psychological safety.

Evidence is provided that Lean leads and in some cases, medical professionals, sought to provide an environment where participants who may not normally have 'a voice' and be listened to, felt psychologically safe in doing so without fear of negative consequences (Kahn, 1990). Edmondson (2004) relates psychological safety to how individuals will assess the potential consequences of feedback, highlighting errors, asking questions or offering suggestions. Edmondson (2004) concludes that perceived organisational support is an enabler of psychological safety and in this case, this support has normally been provided by the Lean

leads. Commonly, those of a professional status are viewed as psychologically safe in comparison to other groups where there is more variation (Nembhard and Edmondson, 2006). As is clear from our illustrations, there is potential for further research in assessing the correlation between Lean performance and psychological safety which results in a fourth proposition:

Proposition 4: Creating psychologically safe spaces and allowing staff of all grades to engage in Lean, facilitates the breakdown of traditional healthcare hierarchies.

What has become evident is the destiny of Lean in the NHS will be determined by professional medical staff as has been evident in other improvement initiatives. Mobilising and diffusing new knowledge in healthcare systems requires the development of learning approaches with and not to the exclusion of the professional groups (Martin et al., 2009; Waring and Currie, 2009).

The four propositions allow for further extending of this research. Further longitudinal studies are required to assess the true impact of Lean in healthcare environment, the roles played by professionals in embedding Lean culture, and impact of collaboration between clinicians and managers on sustainability of Lean initiatives. This paper makes a novel contribution to the field of operations management and calls for more inter-disciplinary research to measure the impact of professional demarcations on the success of Lean initiatives in the healthcare environment.

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Appendix 1 – Interview Protocol

Role in Lean

Have you been involved in Lean?

Describe the role you had in Lean improvement?

Lean implementation

Describe the Lean event/project you were involved in?

Pick-ups – type of event, e.g. workout/Kaizen and attendance?

Others that were involved – department? Wider MDT/pathways? Engagement?

Impact

What benefits have been evident from Lean?

What has been the impact of Lean in your service?

(This may be discussed in terms of tangible/intangible benefits and impact)

What challenges do you perceive Lean to face?

If staff challenges identified – which groups are involved? Managers, medical professionals, nurses, administration and why? What impact is there on Lean?

How has Lean progressed in your service, e.g. Follow-on events?

Has this been sustained? Yes/No – reasons?