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Lean implementation in healthcare: offsetting Physicians' resistance to change

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ABSTRACT

Physicians' resistance towards Lean is often viewed as an important barrier to its successful implementation in healthcare organisations. However, there exists a dearth of knowledge regarding what influences reactions from physicians towards Lean and what organisations can do about it. This study adopts a behavioural perspective and focuses on the triggers of physicians' resistance towards Lean. Using longitudinal qualitative data from multiple case studies of Canadian hospitals, 15 behavioural triggers are identified. A cross-case analysis reveals that core-technical and efficiency-driven changes clash with medical professionalism and generate active resistance from physicians, while leadership and familiarity with Lean are linked to championing behaviours that mitigate it. This study provides a deeper understanding of physicians' behaviours during Lean transformations and the factors that drive resistance. It also provides insight into how organisations can better engage their medical staff in their Lean efforts by focussing on the process of change to offset resistance.

1. Introduction

Lean Management keeps gaining traction as a way of facing the challenges of modern, cost-effective care provision (Tlapa et al. 2020; Henrique and Godinho Filho 2020). According to Souza (2009), the first documented use of Lean in healthcare from the scientific literature dates back to the early 2000s, in countries such as the United States and the United Kingdom. Since then, it has made its way into other healthcare systems around the world (Moraros, Lemstra, and Nwankwo 2016; Costa and Godinho Filho 2016). Naturally, this phenomenon has led to increased attention from the operations management (OM) community (Bamford et al. 2015; Matthias and Brown 2016; De Regge, Gemmel, and Meijboom 2019; Leite, Bateman, and Radnor 2020; Lindsay, Kumar, and Juleff 2020). Over the last ten years, the pace of empirical research on Lean in healthcare has increased steeply (Henrique and Godinho Filho 2020). At its core, Lean is a holistic management system based on a culture of continuous improvement (Womack and Jones 2015). While some authors have challenged its sustainability and benefits for healthcare organisations (Moraros, Lemstra, and Nwankwo 2016; McCann et al. 2015), others have concluded that Lean can have positive impacts for hospital performance, notably in terms of quality of care (Shortell et al. 2018), patient flow (Tlapa et al. 2020) and staff support (Costa and Godinho Filho 2016). However, its sustained implementation remains difficult (Fournier and Jobin 2018; Po et al. 2019). There also remains gaps in our understanding of the underlying mechanisms that create barriers to its implementation (Henrique and Godinho Filho 2020).

To that extent, the resistance of physicians towards Lean change has come to the forefront of this discussion (Akmal et al. 2020; Lindsay, Kumar, and Juleff 2020). Practitioners have argued that physician engagement is critical to the success of Lean (Toussaint, Billi, and Graban 2017), while other scholars consider physicians a barrier to its implementation (Lorden et al. 2014). This has led the scientific community to call upon researchers to study this phenomenon (Shortell et al. 2018; Henrique and Godinho Filho 2020; Leite, Bateman, and Radnor 2020).

Recent studies have identified physicians' lack of engagement and resistance as a barrier to Lean implementation (Leite, Bateman, and Radnor 2020; Fournier, Chênevert, and Jobin 2021; Lindsay, Kumar, and Juleff 2020; Akmal et al. 2020). While these studies discuss the importance of physician engagement for the successful implementation of Lean in healthcare, they also highlight the dearth of knowledge regarding our understanding of what influences their behaviours towards it and, more specifically, what organisations can do about it. Considering that evidence of Lean's positive impact on organisational performance has recently surfaced in the literature (Shortell et al. 2018; Tlapa et al. 2020), and that hospitals are likely to keep investing time and resources into Lean initiatives, further study of this phenomenon could prove significant for scholars, healthcare managers, and policy-makers.

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2. Literature review

2.1. Physicians as organizational actors

The literature on organisational theory in healthcare highlights two synergistic characteristics that define physicians as central organisational actors: their status and power. These characteristics have historically allowed the medical profession to defend itself from managerial influence (Dent 2003). Sociology has also provided us with a better understanding of physicians' behaviours in healthcare organisations through the theory of professionalism (Freidson 1999). While healthcare remains a multidisciplinary field, the medical professional logic remains the dominant one (Currie et al. 2012). The clinician status, atop healthcare's professional hierarchy , defines the identity of physicians (Kellogg 2009), conferring considerable autonomy over the organisation of work and decision-making. The monopoly of expertise they exert over care provision further contributes to their power as stakeholders (McNulty and Ferlie 2002). In the end, physicians are the *de facto* central 'decision makers' of both the clinical and administrative domains (Battilana and Casciaro 2012).

Physicians' status and power can have consequences which can impact managerial decisions. Physician-hospital alignment can prove challenging because it requires both economic and non-economic integration, meaning that it requires both contractual and collaborative mechanisms (Trybou, Gemmel, and Annemans 2011). Research has shown that physicians tend not to be influenced by traditional rewards or incentives (Callister and Wall 2001) and that their professional judgement can lead them to forgo organisational rules (Dent 2003). Physicians often have the power to veto managerial decisions, creating a leadership paradox in which one group of stakeholders possesses disproportionate influence over others, within the collaborative governance mechanisms that determine the success of healthcare organisations (Fournier and Jobin 2018).

2.2. Physicians and organizational change

The challenge of engaging physicians in organisational change is well documented (Nilsen et al. 2019). This is particularly true with managerial innovations (Cabana et al. 1999), which often clash with the dominant medical professional logic (Bartram et al. 2020; Currie et al. 2012; Suddaby and Viale 2011). During such change, physicians tend to tightly negotiate their participation and use their influence in order to better control outcomes (McNulty and Ferlie 2002; Bartram et al. 2020). If they believe it might negatively impact the quality of care they provide (Cabana et al. 1999; Mathie 1997), the organisation of their work (Rogers, Silvester, and Copeland 2004), or their economic well-being (Greco and Eisenberg 1993), they are more likely to resist. Furthermore, if a change is perceived to threaten their professional status (Light 2000), decision-making authority or professional judgement (Greco and Eisenberg 1993), physicians also tend to strongly resist. Scholars have even stated that innovations that could improve quality can be blocked by physicians because they wish to protect their professional autonomy (Denis et al. 2002). It must be emphasised, however, that physicians can also be powerful change agents (Mathie 1997), as long as they share ownership and are involved in decision-making regarding the change (Bartram et al. 2020).

2.3. Physicians and lean change

Scholars studying Lean implementation in healthcare have highlighted physicians' resistance as a significant barrier to its successful implementation (Waring and Bishop 2010; Lorden et al. 2014; Lindsay, Kumar, and Juleff 2020; Henrique and Godinho Filho 2020; Leite, Bateman, and Radnor 2020). Notably, Leite, Bateman, and Radnor (2020) identified physicians' resistance as an ostensible barrier to Lean implementation, resulting from their influence within the co-production process of healthcare. According to Lindsay, Kumar, and Juleff (2020), the professionalism of the healthcare environment offers a promising path of explanation. Indeed, Akmal et al. (2020) identified various areas of incompatibility between the medical professionalism and Lean logics. For example, medical professionalism tends to focus on the quality of care, whereas Lean usually targets quality of processes. This gap creates resistance from physicians who tend to view Lean as a manufacturing approach not applicable to healthcare. The authors also identify various cultural incompatibilities where Lean challenges key notions of the medical professional logic. For example, Lean focuses on the elimination of wastes (such as mistakes) through root-cause analysis and problem solving (Kaplan et al. 2014), which challenges the assumption of medical professionalism that mistakes are inevitable.

The literature on New Public Management (NPM) also provides a rich perspective (Osborne 2006) into this phenomenon of resistance to change. At the end of the twentieth century, the emergence of NPM as the new paradigm asserting the superiority of private-sector managerial approaches resonated deeply within public healthcare systems around the world. It notably brought about major reforms built on results-based frameworks (Bovaird 2005), which resulted in a 'tyranny of efficiency' that exacerbated resistance towards managerial innovations from professionals (Fournier and Jobin 2018). Thus, it is not inherently surprising that Lean has been met with much scepticism from physicians. After all, Lean's move into healthcare originated from the success it showed in private manufacturing companies and did so, to a certain extent, under the NPM umbrella.

However, while the extant literature converges upon the clash between medical professionalism and Lean as an explanation for this resistance, there exists a dearth of knowledge as to what organisations can do about it. More precisely, there remains a gap in our understanding of how change management can reduce or exacerbate the resistance that stems from the incompatibility of these two competing logics. In this research, we aim to provide a better understanding of how change antecedents trigger resistance or engagement behaviours from physicians and how, over time, these triggers might help reduce the inherent gap

between medical professionalism and Lean. To do so, we performed a qualitative study based on analytic induction (Gilgun 1995; Patton 2002), using longitudinal case studies of three separate Canadian healthcare organisations. We anchored our study in two conceptual frameworks (Herscovitch and Meyer 2002; Oreg, Vakola, and Armenakis 2011), focussing on individuals' behavioural reactions to organisational change. Through this work, we contribute to the ongoing development of knowledge regarding the underlying mechanisms of clinical involvement in Lean transformations.

2.4. Conceptual framework

As a type of organisational change, Lean can be met with various reactions from change recipients. According to Oreg, Vakola, and Armenakis (2011), individuals' explicit reactions to organisational change can be classified three-way: *affective*, *cognitive* and *behavioural*. Of interest for this research are behavioural reactions, which Herscovitch and Meyer (2002) classify as follows: *active resistance*, *passive resistance*, *compliance*, *cooperation* and *championing* (refer to Table 1 for further details).

These reactions can be influenced by various elements (Oreg, Vakola, and Armenakis 2011). Structural elements are aspects related to the context in which the change takes place, meaning they are not related to the change itself. They are either *individual characteristics* or aspects of the *internal organisational context* already existing prior to the change taking place (Oreg, Vakola, and Armenakis 2011). Functional elements have to do with the change itself. They are aspects that relate to the *content of the change*, the *process of change* or the *perceived benefits* of the change from the recipient's point of view (Oreg, Vakola, and Armenakis 2011). To perform this research, we combined Herscovitch and Meyer (2002) classification of change-related behaviours with Oreg, Vakola, and Armenakis (2011) framework of antecedents of organisational change, to focus on the elements that trigger physicians' behavioural reactions to Lean change and how, over time, certain triggers can help offset resistance towards Lean anchored in medical professionalism.

3. Methods

This qualitative research is based on three longitudinal case studies (Yin 2017) of Canadian hospitals involved in large-scale Lean transformations. Inductive research lends itself well to studying a phenomenon with potential for new insight (Siggelkow 2007). In recent years, qualitative research has proven effective in studying the fuzziness surrounding Lean in healthcare in the OM community (Bamford et al. 2015; De Regge, Gemmel, and Meijboom 2019; Matthias and Brown 2016; Akmal et al. 2020; Lindsay, Kumar, and Juleff 2020).

Our methodology is based on the recommendations of Caniato et al. (2018) regarding case study research in OM. The multiple case study design was chosen to strengthen the external validity of our research, which is further complemented by a longitudinal perspective. Using our conceptual framework, we performed a two-stage analysis using analytic induction (Gilgun 1995; Patton 2002) to study the factors influencing physicians' reactions to Lean change over time.

> In analytic induction, researchers develop hypotheses, sometimes rough and general approximations, prior to entry into the field, or in cases where data already are collected, prior to data analysis. These hypotheses can be based on hunches, assumptions, careful examination of theory, or combinations. (Gilgun 1995)

3.1. Cases

The cases used for this research were three large Canadian public hospitals in the province of Quebec, who each attempted to implement Lean over a three-year period, through the realisation of 10 large-scale Lean improvement projects, with the objective of improving organisational performance in terms of accessibility, quality and efficiency of care. The implementation approach was dictated through a governmental program that provided funding to the organisations. This funding was in part used to hire external consultants from an internationally recognised firm who provided external support, technical knowledge, and know how. The organisations also benefitted from quality management teams made-up of Lean-trained managers with extensive healthcare experience, under the purview of a Director of the Lean Program who reported directly to the CEO. Each hospital had to conduct between 3 and 4 improvement projects per year, over three years. These projects were conducted in various settings, the main ones being operating rooms, medical imaging, emergency departments and hospitalisation. Specific performance metrics were contextually attributed to each project. Hospitals A and B were community-based hospitals situated within large metropolitan areas, serving a combined population of roughly 400,000 individuals, focussing on front-line services as well as specialised services such as cancer-related illnesses and elderly care. Hospital C was part of a large university-affiliated system focussed on high-volume emergency care, on second-line services, as well as specialised tertiary services. For each hospital, we performed interviews with stakeholders after year one (T1; 3–4 completed projects), year two (T2; 6–7 completed projects) and year three (T3; 10 completed projects) of their implementation process. Table A1 of the appendix

Table 1. Types of behavioural reactions to organisational change according to Herscovitch and Meyer (2002).

| Behariouval reactions to organisational change	Definition
Active resistance	Opposition to a change through overt behaviours aimed at its failure.
Passive resistance	Opposition to a change through covert behaviours aimed at its failure.
Compliance	Showing minimum support by going along with a change.
Cooperation	Showing support for a change by making efforts and modest sacrifices favouring its success.
Championing	Showing extreme enthusiasm for a change by going above and beyond what is required.
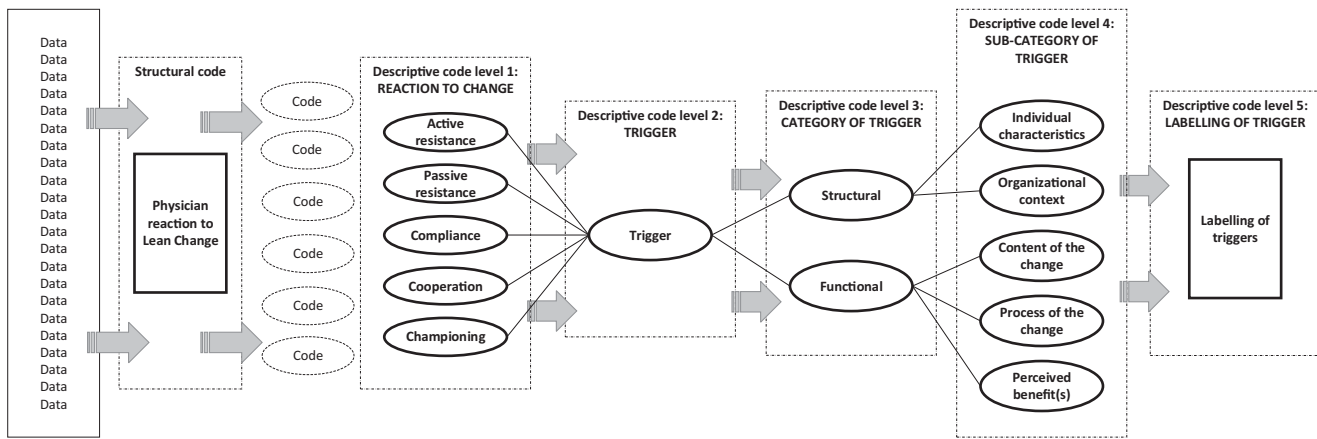
Figure 1. Coding methodology.

provides more general information regarding the three hospitals under study, as well as the list of improvement projects undertaken over three years.

3.2. Data collection

This research is based on the qualitative analysis of data collected within a larger study, which focussed on the wider story of Lean implementation in the three aforementioned hospitals, in which the authors were involved. This larger inquiry consisted of 99 interviews conducted with various stakeholders using open-ended questions related to the implementation their organisation was going through. We used 72 of the original 99 interviews to perform our study focussing on physicians. These transcripts were selected for two reasons: (1) physicians were discussed by respondents either through their own volition or following questions, and (2) they allowed for triangulation between respondents over time. In total, eight participants from each organisation were selected (24 total), who had been interviewed three times each (once a year for three years, at the end of each year). The respondents, for all three organisations, were the Chief Excutive Officer (CEO), the Chief Human Resources Officer (CHRO), the Chief Medical Officer (CMO), the Director of the Lean program, a middle manager and three front-line physicians who had participated in Lean change initiatives. The two-stage analysis based on analytic induction (Patton 2002; Gilgun 1995), used a combination of structural (Guest, MacQueen, and Namey 2012) and descriptive (Miles, Huberman, and Saldana 2014) coding of the data, anchored in our conceptual framework (Oreg, Vakola, and Armenakis 2011; Herscovitch and Meyer 2002).

3.3. Coding and analysis

The first stage, within-case analysis was performed by reviewing the transcripts from each hospital and their respondents. We used a combination of structural (Guest, MacQueen, and Namey 2012) and descriptive (Miles, Huberman, and Saldana 2014) coding to identify physicians'

reactions to Lean change and the elements, or triggers, that appeared to influence them. We then used a synthetic analysis strategy (Langley 1999; Eisenhardt 1989), by pairing each trigger identified by respondents to the corresponding reaction from physicians. We then attributed a label to each trigger and categorised them according to our conceptual framework.

A structural code was used to identify when respondents had discussed physicians' reactions to Lean change. Within each structural code, the type of reaction was identified based on Herscovitch and Meyer's (Herscovitch and Meyer 2002) five types of behavioural reactions to organisational change. For each reaction, its trigger was identified and then categorised, either as a *structural* (pre-existing conditions) or a *functional* trigger (related to the implementation process itself). Structural triggers were then placed within one of two subcategories: *individual characteristics* or *organisational context*. Functional triggers were assigned to one of three subcategories: *content of the change*, *process of the change* or *perceived benefits*. Finally, each trigger was given a specific label allowing for triangulation within and between cases (Figure 1 summarises our coding methodology). While our initial labelling scheme of triggers followed the framework of Oreg et al. (Oreg, Vakola, and Armenakis 2011), we progressively refined it following each iteration to ensure uniformity across cases. Thus, triggers were defined, refined, added or removed when sufficient data permitted so. *The appendices contain an example of a coded transcript excerpt.*

After coding the data, each case was analysed by organising triggers and their related reactions into clustered matrices used to build a chain of evidence following each phase of data collection. We then classified how the preoccupations of respondents regarding those triggers evolved over the three measurement phases, by highlighting when the triggers were discussed (T1, T2 or T3) and if a trend could be observed over time.

The second stage cross-case analysis was performed by comparing the three cases using tables to illustrate the similarities and differences over time. By overlapping the chains of evidence, we detected patterns related to the prevalence

of certain triggers of physicians' reactions to Lean change. In the following section, we will summarise the findings of each case and then focus on the results of the cross-case analysis.

4. Findings

In total, we identified 15 triggers of physicians' behavioural reactions to Lean change through our within-case analyses: four structural triggers and 11 functional triggers. Of those, 12 were common to all three cases, while the other three were common to at least two cases. Structural triggers included individual characteristics such as *work experience* and *previous experience with Lean thinking*, and also triggers related to the internal organisational context such as the *history of change* and the *history of support* physicians perceived from their organisation. Functional triggers included three subcategories. Three triggers were categorised into the *content of the change*: *work organisation*, *complexity of the change* and *core-technical change*. These had to do with what physicians, according to respondents, believed the proposed Lean change was about. Four triggers were categorised into the *process of change*: *communication*, *compensation*, *involvement* and *leadership*. Finally, four triggers were categorised as *perceived benefits*: *cost reduction*, *quality improvement*, *patient satisfaction* and *work life improvement* (Table A2 of the appendix summarises these findings.)

4.1. Cross-case analysis

The second stage cross-case analysis, for which the results are presented in Figure 2, was performed in two phases (Table A3 of the appendix also presents a summary of results). First, we focussed on triangulating the behavioural reactions initiated by each trigger, which we then classified according to our conceptual framework. The chain of evidence created through this process allowed us to refine our understanding of each trigger's effect on the behaviours of physicians by associating them with their induced behavioural reactions. This part of the analysis is represented by the *Y* axis in Figure 2.

Phase 2 of the cross-case analysis focussed on the evolution of the relationship between the triggers and their induced behaviours, over the course of the Lean implementation process. Again, through triangulation between the three cases, we were able to assess if the relationship between a trigger and the corresponding reaction changed from T1 to T2, and from T2 to T3. We evaluated how frequently these relationships were discussed by participants, by counting the occurrences and how often they repeated from respondent to respondent between cases. We then considered compared these results between the three measurement phases. By assessing these relationships, we could evaluate if said relationships remained constant over time, eventually disappeared or appeared later during the implementation process. This part of the analysis is represented by the *X* axis of Figure 2.

4.2. Triggers of resistance behaviours

During the first year of implementation (T1), active and passive resistance were triggered by various perceptions and pre-existing conditions. Older, more experienced physicians passively opposed Lean through such actions as questioning the merits of the approach and retreating into paradigmatic views of Lean as a manufacturing-based solution not applicable to healthcare. Physicians' negative perceptions of the internal organisational context also triggered passive resistance in the early stages of implementation, specifically with regards to the organisations' history of change and its history of providing individualised support during change. The following quote provides support for this assertion:

> In most of our projects, I had physicians come up to me and say: those things didn't work the last twenty times you tried. Why would it be any different now? *Director of the Lean program – Hospital B – T1*

These findings, associated to T1, are not inherently surprising for two reasons. First, clinical staff have historically been resistant towards managerial innovations (McCann et al. 2015), in part because they have seldom shown the ability to provide meaningful improvements to care-provision systems. The second reason has to do with the historical context of healthcare organisations in Québec, where healthcare workers are increasingly faced with change fatigue. In recent years, Québec's healthcare system has gone through multiple systemic structural changes which have exacerbated working conditions and done little to improve organisational performance (Pineault et al. 2016). Interestingly, as the organisations became more familiar with Lean, experience and the internal organisational context no longer triggered resistance from physicians. These effects dwindled and eventually disappeared in T3.

As implementation progressed, resistance behaviours were generated by functional triggers related to the implementation process itself. When physicians believed the proposed change targeted the organisation of their work or if they saw it as highly complex, instances of active and passive resistance were reported in T1 and T2.

> Yes we did [look at the organization of work]. In that instance, we asked physicians to come into work 20 minutes earlier than what they were currently doing. Most did not partake in this request. Some were quite vocal about it, while others just didn't do it. *CHRO – Hospital A – T1*

However, two triggers created active resistance throughout the implementation process. First, physicians tended to exhibit overt opposition behaviours when under the impression that the Lean initiative's main benefit would be *cost reduction*. This is in line with other researchers' conclusions regarding the aversion of healthcare staff regarding Lean as an efficiency-driven approach (Akmal et al. 2020; Radnor, Holweg, and Waring 2012). One respondent was quoted as saying:

> We came in and for some reason [the physicians] thought this was about cutting costs, increasing productivity. It wasn't really, but it definitely came across that way. Both physicians who were involved in the project went back to their colleagues and pretty
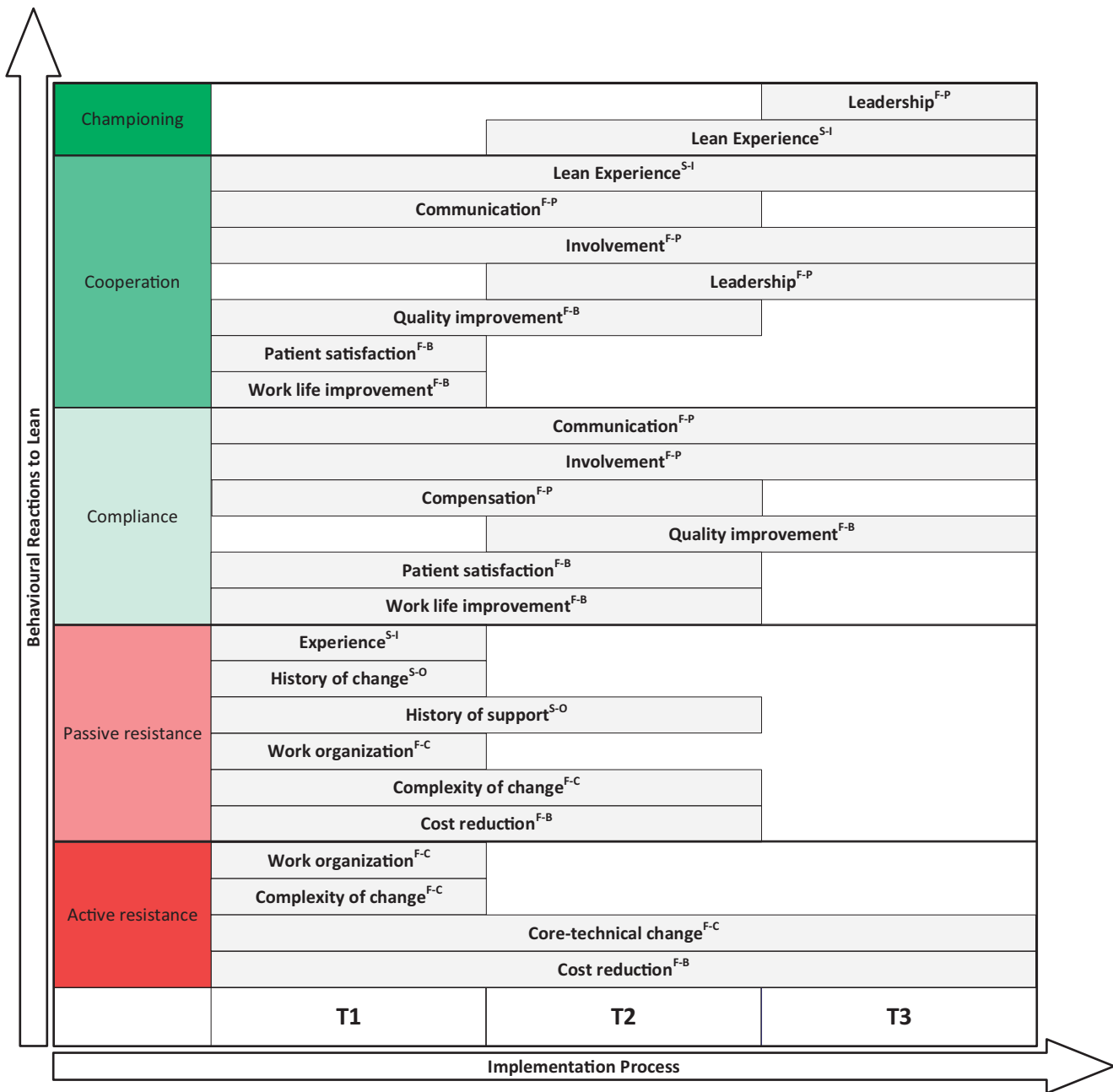
Behavioural Reactions to Lean		T1	T2	T3
Championing				Leadership^F-P
			Lean Experience^S-I	
Cooperation		Lean Experience^S-I		
		Communication^F-P		
		Involvement^F-P		
			Leadership^F-P	
		Quality improvement^F-B		
		Patient satisfaction^F-B		
		Work life improvement^F-B		
Compliance		Communication^F-P		
		Involvement^F-P		
		Compensation^F-P		
			Quality improvement^F-B	
		Patient satisfaction^F-B		
		Work life improvement^F-B		
Passive resistance		Experience^S-I		
		History of change^S-O		
		History of support^S-O		
		Work organization^F-C		
		Complexity of change^F-C		
		Cost reduction^F-B		
Active resistance		Work organization^F-C		
		Complexity of change^F-C		
		Core-technical change^F-C		
		Cost reduction^F-B		

Implementation Process

Legend:
S = Structural antecedent -> I = Individual characteristics; O = Organizational context
F = Functional antecedent -> C = Content of the change; P = Process of change; B = Percived benefits

Figure 2. Triggers of behavioural reactions to Lean change over time.

much killed it in the egg. They would not go along with it because they thought it was about [cost reduction]. *CEO – Hospital B – T2*

Secondly, the thought of seeing the core aspects of their work, medical practices, being targeted by Lean change created strong resistance. In fact, when analysing the data, it became apparent that the perception of *core-technical* change was the biggest initiator of active resistance from physicians, as the following statement articulates:

That's a no go. We went there a few times and it always backfired. If you touch [medical practices], this is where they will

fight you tooth and nail. We've had success with other professionals, but our clinicians (physicians), well it is a different story. *Director of the Lean program – Hospital A – T3*

Overall, behaviours such as not attending important meetings related to an improvement project, openly opposing the change in discussions with colleagues, and going so far as to make data collection more difficult for consultants were triggered by the belief of Lean being used for reducing costs or for changing medical practices. *In fine*, these two triggers are possibly those who create the most friction with the dominant medical professional logic, which in turn results in the strongest resistance behaviours.

4.3. Triggers of change supporting behaviours

Positive change supporting behaviours were triggered by different elements related to the change. First, perceived benefits related to *patient satisfaction* and the quality of *work life* triggered *compliance* and *cooperation* behaviours in T1, though by T3, these triggers did not create any change-related behaviours. Considering the core Lean tenants of 'creating value for the customer' and of 'respect for people', this finding brings into question some of the basic principles of Lean and how it positions itself in the eyes of physicians.

Perceived benefits to *quality improvement* appeared more conductive to positive supporting behaviours over time, but in T3, *cooperation* behaviours were no longer enacted by it and only *compliance* behaviours were triggered. It is important to note that this research did not delve into the various dimensions of quality in healthcare. Since 30 improvement projects were undertaken within the three hospitals, quality improvement may have taken on different meanings and metrics depending on the clinical or managerial circumstances, such as the reduction of medication errors or infections. We therefore focussed our attention to quality improvement in general and how respondents discussed the issue.

> If they can see that it's about improving our quality of care, it's easier to get them to somewhat engage in it (Lean change). That's what we got in our long-term care centres. They (physicians) didn't really help us, but they didn't resist or oppose it. *CHRO – Hospital A – T2*

Functional triggers linked to the process of change were deemed to significantly influence positive reactions from physicians, with the exception of *compensation*. While paying physicians specifically for their participation in a Lean project did generate compliance in T1 and T2, its effects did not reach beyond that. In fact, recent research by Fournier, Chênevert, and Jobin (2021) has found that compensating physicians for specifically taking part in Lean initiatives might be counterproductive. Change management practices contributed positively to change supporting behaviours. Good communication triggered *compliance* behaviours in all three implementation phases, while *cooperation* was observed in T1 and T2. Furthermore, from T1 to T3, involving physicians in the decision-making process regarding the change proved conductive to both *compliance* and *cooperation*.

> We don't start a project without a good communication plan. We learned that from our first projects. When we did that project (outpatient clinics), we made sure to communicate from start to finish. It definitely helped a lot [to get physicians' cooperation]. *CEO – Hospital A – T3*

> It's not just about keeping them informed. They want to have a say and be a part of the decisions. When we do that, we get a lot less resistance.

> *Director of the Lean program – Hospital C– T3*

The contribution of these triggers to the change-related behaviours of physicians in our cases corroborates those of Akmal et al. (2020), who posit that communication, while frequently used by managers as a tool to engage stakeholders in change, is not sufficient to offset the more potent resistance behaviours.

Championing behaviours were not frequently observed through our analysis. When they were, however, they appeared to be linked to two specific triggers. First was *previous experience with Lean* thinking. When physicians undergoing Lean change had previously positively experimented with the approaches and techniques of Lean, or if they had had formal training in the approach, positive reactions were observed. From T1 to T3, *Lean experience* triggered *cooperation* from clinicians, while starting in T2, it went as far as to trigger *championing* behaviours. The following statement from hospital B's CMO is eloquent:

> We had one (physician) who did his Green Belt (Lean training) a few years ago. He really acted as a catalyst to get his colleagues on board. To convince them this was a good idea. He understood the motivations behind Lean.

> *Chief Medical Officer– Hospital B – T3*

Cooperation and championing behaviours were also triggered by leadership. Curiously, this appeared much later in the implementation process. In fact, while *cooperation* was triggered by leadership in T2, it wasn't until all three hospitals were further along, in T3, that leadership generated *championing* behaviours. Even more so, *leadership* appeared as a trigger able to counterbalance and even overwrite active resistance triggered by *core-technical* changes and perceived benefits of *cost reduction*. As one CEO points out:

> Really, I think it's all about our change agent, our leader. When our project manager acts accordingly, it helps us not only get them (physicians) on board, it turns them into change agent themselves. That's what happened in our geriatric unit. The manager was a seasoned leader and she managed to create this cohesion, this alignment. *CEO – Hospital C – T3*

Overall, our cross-case analysis allowed us to develop a detailed chain of evidence of three years of Lean implementation in each hospital. Through triangulation, we managed to identify how each trigger appeared to generate reactions from physicians over time. As we will discuss, most structural triggers disappeared from consideration within the hospitals, as some functional triggers took on a more prominent role.

5. Discussion

Considering the increasing prevalence of Lean implementation in healthcare organisations and systems, our findings offer an interesting contribution to its ongoing challenges. Since physicians are central actors of its implementation process, their negative reactions towards it can create important barriers (Fournier and Jobin 2018; Leite, Bateman, and Radnor 2020; Akmal et al. 2020). Arguably, without physician's engagement, Lean in healthcare cannot reach its full potential (Lorden et al. 2014). It then becomes essential to understand what drives their reactions so that organisations can act accordingly. Our research builds upon recent works of the operations management literature (Fournier, Chênevert, and Jobin 2021; Lindsay, Kumar, and Juleff 2020; Akmal et al. 2020), by focussing on the behavioural dimension of medical resistance to Lean.

5.1. The underlying resistance of physicians towards Lean

As discussed previously, Lean clashes with the dominant medical professional logic found in healthcare organisations, which creates an underlying resistance that is present from the onset of any change initiative and not easy to offset. While the use of Lean in healthcare is varied and touches upon various dimensions of the care system, such as ancillary services and procurement, resistance is typically much greater when used in clinical settings (Lindsay, Kumar, and Juleff 2020; Fournier and Jobin 2018).

In our study, the most negative resistance behaviours were triggered when physicians perceived that a proposed Lean change would target their medical practices. As argued by Dent (2003), resistance from physicians tends to be triggered by any type of change questioning their status as medical professionals or their decision-making autonomy. During our interviews, a few respondents even mentioned that they shied away from trying to improve processes heavily involving physicians' clinical practices, because they could predict that resistance would be high. However, they also concluded that this was futile. Since Lean aims at improving processes and flow, it will inevitably come into contact with physicians' clinical work.

Active resistance behaviours were also triggered by perceptions of efficiency-driven Lean implementation. This echoes research on NPM, presented earlier, and its deleterious effects created over the last thirty years combined with the apprehension of Lean as a manufacturing approach. However, the resistance triggered by perceptions of cost reduction can also further be explained through a behavioural lens. Physicians usually associate available resources to their own self-efficacy (Amiot et al. 2006). If they believe that Lean's main objective is to reduce such resources, the perceived threat is even greater which triggers more resistance. This effect may also have been exacerbated in the organisations under study, because most Canadian physicians are independent fee-for-service providers (Contandriopoulos and Brousselle 2018), which might create an even bigger gap between physicians' perceived self-efficacy and organisational interests, and ultimately compound resistance behaviours. Our findings help draw a clearer picture regarding the underlying resistance of physicians towards Lean and the triggers that exacerbate it. However, the question remains, what can organisation do about it?

5.2. Offsetting medical resistance to Lean

The underlying resistance of physicians towards Lean change is unlikely to go away, at least for the foreseeable future. As explained earlier, the clash between the Lean and medical professional institutional logics results in an inherent apprehension towards Lean. To face this issue, organisations have used traditional change management practices such as communication and training to try to engage stakeholders in change efforts. While these practices have been linked to healthcare professionals supporting change (Nilsen et al.

2019), our results show that, in the case of physicians and Lean, these approaches are not sufficient. This echoes the findings of Akmal et al. (2020). When triggered by threats to medical professionalism, resistance towards Lean is too strong to be overcome by simple change management strategies. However, our results also show that it is possible to offset active resistance by triggering championing behaviours that support change through leadership and familiarity with Lean.

The emergence of leadership in the later phases of our study was surprising not because it triggered positive change supporting behaviours, but because it did it strongly. In the early stages of implementation, leadership was not a priority for the organisations under study. But, as they progressed, the organisations realised that high levels of leadership could create championing behaviours. In general, the literature on Lean advocates transformational leadership as a blueprint for managerial behaviour (van Rossum et al. 2016). Akmal et al. (2020) focus on *leading by example*, which is but one of the various dimensions of transformational leadership (Podsakoff, MacKenzie, and Bommer 1996). However, in the case of healthcare and physicians, the introduction of shared leadership in combination with the former could prove even more conductive. For example, Bartram et al. (2020) discuss co-ownership as a way of engaging physicians in workplace innovation. As our findings show, mere participation is not enough to trigger strong change supporting behaviours. In T3, Lean leaders of the organisations invested efforts to create environments in which physicians shared leadership in driving improvement efforts forward, by being present on units and departments where projects were underway and become part of the team. They also focussed on sensemaking and collaboration with physicians, as opposed to simply communicating generic messages from top management. This *salience of leadership*, unearthed by our findings, also highlights the importance for organisations to wisely choose their change agents. It also brings our attention to the implementation strategies used by healthcare organisations, which influence the acceptance and adoption of Lean (Hung et al. 2015). In our study, the implementation of Lean stemmed from a governmental program. In other words, it used a top-down approach. While physicians and staff were consulted in the early stages and participated in discussions about the implementation process, the implementation teams realised how detrimental this top-down strategy had been to the overall resistance of physicians. Thus, the emergence of transformational and shared leadership was also due to the need to catch up with resistance that emerged from the get-go and that could not be overcome through traditional change management practices.

Uncertainty and unfamiliarity regarding a change is typically linked with resistance (Holt et al. 2007). In the case of Lean, this is sometimes compounded by the jargon it uses that is not endogenous to the medical profession. Furthermore, Lean relies on system thinking, which can be counterintuitive with regards to medical professionals who tend to focus on the care they provide to individual patients. For some physicians, this incompatibility might result in an

inherent misunderstanding of Lean. To this end, our findings regarding the championing behaviours triggered by experience and familiarity with Lean in the second wave of improvement projects are interesting. In some instances, physicians already experienced in Lean thinking were involved in projects at the start, but elsewhere, projects were undertaken where physicians had not previously experimented with Lean. Knowing how strong an effect it triggered when dealing with resistance, members of the improvement teams deployed efforts and activities that were not simply aimed at informing physicians about Lean in general and its jargon, but rather by combining 'on the job' coaching and training. Notably, daily improvement and coaching routines were used to reduce the gap between the professional and Lean logics, where change agents and managers would spend structured time, every day, going through problem solving activities with clinicians. This approach favoured a deeper understanding of Lean, which progressively merged process thinking with quality of care. Today, this practice is known as *Toyota Kata* (Rother 2019) and is gaining popularity among Lean practitioners and organisations. In the end, it proved effective at combing *leadership* and *experience with Lean*, which we identified as triggers of championing behaviours able to offset active resistance from physicians.

6. Conclusion

This study contributes to the developing research regarding Lean implementation in healthcare. Recent research exploring medical resistance towards Lean has mostly considered resistance as a monolithic construct (Akmal et al. 2020; Lindsay, Kumar, and Juleff 2020; Leite, Bateman, and Radnor 2020). Our research enhances that perspective by delving into the behavioural dimensions of resistance, which helps offer insight into what triggers specific change-related behaviours and how organisations can offset resistance.

6.1. Implications for research

Our analysis allowed us to triangulate data from three qualitative case studies and identify triggers of physicians' resistance towards Lean. The use of multiple cases in addition to a longitudinal approach and a balanced pool of respondents, half of which were physicians, enhances the validity of our findings (Caniato et al. 2018). The analysis also allowed us to uncover the effects of those triggers over time. We found that triggers which conflicted the most with medical professionalism, *core-technical change and perception of cost reduction*, created the strongest resistance behaviours. We also corroborated findings from other researchers, concluding that traditional change management strategies, for example *communication*, are not sufficient to countervail active resistance. Our findings show, however, that there are triggers, *leadership* and higher *familiarity with Lean*, that can generate championing behaviours and offset such resistance. This research builds upon the recent works of other OM scholars (Leite, Bateman, and Radnor 2020; Akmal et al. 2020; Lindsay,

Kumar, and Juleff 2020), expanding it through a behavioural lens that considers the multifaceted nature of resistance to organisational change (Oreg, Vakola, and Armenakis 2011; Meyer et al. 2002). This approach contributes a deeper understanding of the mechanisms through which medical resistance towards Lean manifests.

6.2. Implications for practice

This research also has meaningful implications for healthcare organisations. Managers and practitioners attempting to introduce Lean in the healthcare setting are often confronted with high levels of resistance from physicians. Our findings show that organisations should not merely rely on traditional change management strategies unlikely to be productive. Rather, they should leverage the *leadership* of both their change agents and physicians, in order to create a setting through which leadership is shared and a common understanding created. Ultimately, the underlying resistance created by the clash between managerialism and medical professionalism, nurtured over the last thirty years by the deleterious effects of NPM, will remain present. But organisations can counteract this, by investing time and efforts into the triggers of strong change-supporting behaviours early into the implementation process, through sensemaking and coaching routines that will increase the chances of progressively overcoming strong resistance.

The results of this research should also make policy-makers question how and why they adopt and deploy Lean-related policies. Unfortunately, system-wide Lean transformations are still too often promoted via top-down policy deployment mechanisms that tend to create resistance and do little to promote shared leadership between managers and clinicians. Instead of promoting Lean as a simple driver of performance improvement, policy-makers should consider it as a framework that promotes the integration of managerial and medical priorities, that centre on patients' needs and well-being.

6.3. Limitations and future research

This study's results should be interpreted within its limitations. First, there might be other elements that trigger physicians' reactions towards Lean that fall outside the scope of this research. Contextual elements not accounted for might also exist that have to do with the varied settings of care provision. For example, physicians in an oncology ward might react differently to certain triggers than orthopaedic surgeons. Triggers might also induce different reactions from specialists than they would general practitioners. Furthermore, the timespan of this study might not fully account for how Lean evolves over time, considering Lean transformations can take place over much longer periods of time (Radnor, Holweg, and Waring 2012; Shortell et al. 2018). The three-year period might also limit our ability to conclude on sustained behavioural changes, which might take place over a longer period.

Nonetheless, this study paves the way for future research. While we focussed strictly on physicians, healthcare is not a unidisciplinary field. The interactions of Lean with other

professionals should also be studied to understand how each's reactions towards Lean can differ or converge. Additionally, while our study focussed on the behavioural dimensions of individuals' reactions to organisational change, the triggers identified in this research could be studied in relation to the affective and cognitive dimensions of change-related reactions, as these are not necessarily independent from one another (Oreg, Vakola, and Armenakis 2011). Moreover, our study revealed the emergence of *Katas* as a practice that can favour shared leadership and an increased adaptability of Lean to the healthcare context. While the practitioner literature on this subject is quickly developing (Rother 2019), the scientific literature is extremely thin. Further research into this phenomenon would prove insightful moving forward. Also, further generalisability could be provided through the comparison of different jurisdictions to account for our study's limited scope of Canadian hospitals, as well as through quantitative inquiry.

Ultimately, this study helps to provide a deeper understanding of the underlying mechanisms related to physicians' reactions to Lean change and in turn, contribute meaningful knowledge regarding the implementation of Lean in healthcare, while helping to guide organisations undergoing such transformations.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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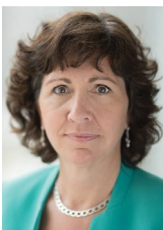
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Appendix

Table A1. Characteristics of the three studied hospitals.

	Hospital A	Hospital B	Hospital C
Type of hospital	Community hospital	Community hospital	University-affiliated hospital
Number of employees	3900	2500	14000
Number of physicians	250	200	1700
Size of serviced population	180,000	220,000	700,000
Improvement projects (sectors or processes where projects took place)			
Year 1	• Medical imaging • Surgical operating rooms • Food services	• Emergency department • Procurement • Surgical operating rooms • Pre-admission and pre-operation	• Surgical operating rooms • Child and youth care • Emergency department
Year 2	• Long-term care centres • Test centre • Wheelchair rental services • Human resources (call list)	• Medical imaging • Home care • Geriatric medicine unit	• Family medicine unit • Geriatrics • Central surgical planning • Disposal of medical waste (sterilization)
Year 3	• Outpatient clinics • Archives • Hospitalisation planning	• Human resources (call list) • Hospitalisation • Test centre	• Geriatric medicine unit • Orthopaedics (hip and knee replacement) • Post-partum and nursery

Table A2. Within-case analysis: triggers of physicians' reactions to Lean change.

Category	Sub-category	Trigger	Cases where identified
Structural	Individual characteristics	Experience	Hospitals A, B and C
		Lean experience	Hospitals A, B and C
	Internal organisational context	History of change	Hospitals A, B and C
		History of support	Hospitals A, B and C
Functional	Content of the change	Work organisation	Hospitals A, B and C
		Complexity of change	Hospitals A and B
		Core-technical change	Hospitals A, B and C
	Process of change	Communication	Hospitals A, B and C
		Compensation	Hospitals A, B and C
		Involvement	Hospitals A, B and C
		Leadership	Hospitals A, B and C
	Perceived benefit(s) of the change	Cost reduction	Hospitals A, B and C
		Quality improvement	Hospitals A, B and C
		Patient satisfaction	Hospitals A and B
		Work life improvement	Hospitals A and C

Table A3. Behavioural reactions to Lean change.

Category	Sub-category	Trigger	Reaction of physicians	Evolution from T1 to T3
Structural	Individual characteristics	Experience	Passive resistance	Decrease
		Lean experience	Cooperation and Championing	Constant
	Internal organisational context	History of change	Passive resistance	Decreased
		History of support	Passive resistance	Decreased
Functional	Content of the change	Work organisation	Active and passive resistance	Decreased
		Complexity of change	Active and passive resistance	Decreased
		Core-technical change	Active resistance	Constant
	Process of change	Communication	Compliance and cooperation	Constant
		Compensation	Compliance	Decreased
		Involvement	Compliance and cooperation	Constant
		Leadership	Cooperation and championing	Increased (strong)
	Perceived benefit(s) of the change	Cost reduction	Active and passive resistance	Constant
		Quality improvement	Compliance and cooperation	Constant
		Patient satisfaction	Compliance and cooperation	Decrease
		Work life improvement	Compliance and cooperation	Decrease

Example of a coded transcript excerpt

In this example, an active resistance reaction (R1) was triggered by a perceived lack of involvement of physicians in the undergoing Lean change. This trigger (TR10) was classified in the process subcategory of functional triggers (Table A4).

Table A4. Example of coded transcript.

Structural code: PHYSICIAN REACTION TO LEAN CHANGE		
I:	So can you tell me more about the improvement project you did in the operating room?	
P:	Yes, of course, I was present from start to finish so I can offer some input.	
I:	Okay, great. Can you tell me about physicians and how they were involved in all of it?	
P:	Oh yes, sure. Let's just say it's something we struggled with.	
I:	Okay, and why do you say that?	
P:	[R1]Well, most of them resisted a lot. They weren't happy about the change. Some of them were really vocal about it, and others just pretty much ignored us and kept doing their thing.	[R1]Reaction – Active resistance
I:	Do you have any idea why that happened?	
P:	Well, I think there are a few reasons for that. You know how doctors are. [TR10-R1] They don't like being told what to do and I think they felt the Kaizen was imposed on them and they felt they weren't really consulted before doing it. I think we should've probably done a better job of talking to them and getting a better feel for it.	[TR10-R1]Trigger – functional – process – involvement

I: Interviewer; P: Participant.