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Performance measurement to drive improvements in healthcare practice

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Introduction
Healthcare organizations are currently facing challenges such as an ageing population (Nolte and McKee, 2003), medical and technological advances, and citizens’ expectations of being a demanding, well-informed healthcare co-actor, all of which make healthcare difficult to manage (Elg et al., 2011). In response to these challenges, healthcare organizations struggle to find ways to manage their organizational systems. Performance measurement is one approach that has received much attention from elected officials, administrative leaders, and professionals alike (SKL, 2007; Radnor and Lovell, 2003; De Vos et al. 2009; Klassen et al. 2010). One reason for the popularity of performance measurement in healthcare is its versatility (Behn, 2003). Performance measurement is recognized as an option in various parts of the system for public transparent reporting (Schneider and Epstein, 1998), resource funding (Collins and Davis, 2006), administrative control, and development (Radnor and Lovell, 2003) and improvement of clinical practice (Nelson et al. 1996).

For scholars of operations management, the topic of performance measurement in healthcare is of vital importance and provides a challenge. One important reason is the often-neglected issue of the gap between rhetoric and practice. Although many healthcare leaders and policymakers emphasize the role of managing through measures, little evidence exists that practitioners really use the measures. Reporting is one thing, but the application of measures requires established infrastructures and engaged leaders (Elg, 2001; Radnor and Lovell, 2003). In line with this, Behn (2003) stressed that managers within public organizations that strive to manage through measures “need to think carefully not only about why they are measuring, but also about what they will do with these measurements and how they will employ them to improve performance” (p. 600). Therefore, the question is not only to choose,
define, and design performance measurement in particular healthcare settings, but also to find out how these measurements should be used in practice. The perspective emphasized in this study shifts away from performance measurement concepts to how they are practiced in organizations.

Based on the above discussion, this paper aims to contribute to the knowledge on how performance measurement drives improvements in healthcare practice. Two research questions guide the present work.

RQ1: What types of activities are related to performance measurement in healthcare practice?

RQ2: How do organizational activities including performance measurement drive improvements?

The departure point for the analysis is based on an in-depth case study of a healthcare department’s application of performance measurement. The department is located in southeast Sweden and is responsible for orthopedic and rheumatologic care for 150,000 inhabitants of its region. The case approach is used to contribute to a practice-based understanding of the various roles held by performance measurement and how these roles can drive improvements.

Performance measurement: a general overview

Performance measurements have gained great attention in research over the last decade. Several authors prescribe how to best design systems for performance measurement. For instance, measures should be derived from strategy (Keegan et al., 1989; Kaplan and Norton, 1992; Anthony and Govindarajan, 2001), represent different dimensions of an organization (Keegan et al., 1989; Kaplan and Norton, 1992; Simons, 1995), and consider all stakeholders of a company (Neely et al., 2002). In addition, the management literature has proposed several performance measurement frameworks that present and visualize different aspects of an organization (Cross and Lynch, 1988/89; Kaplan and Norton, 1992; Fitzgerald and Moon, 1996; Neely et al., 2002). Moreover, management control is often discussed in the accounting and strategy literature as an important purpose for performance measurement (see, e.g., Chenhall and Langfield-Smith, 2007; Anthony and Govindarajan 2001; Bruns, 1993).

In theory, three approaches to performance measurement can be identified. The first approach is the management accounting perspective that states that measurement should be integrated into the planning and budgeting of organizations (Otley, 1999). The second approach points out from an operations perspective that performance measurement is a “set of metrics used to quantify both the efficiency and effectiveness of actions” (Neely et al., 2005, p. 1220). Additionally, from an operations perspective, measurement is viewed as a process whereby feedback on the outcome of actions is presented to the organization’s members (Bititci et al., 1997). A third approach stresses strategic control. Within this view, importance is given to the relationship between upper management and operations. Deployment of goals and their related measurements link strategic initiatives with operational performance. Management can also be provided with information needed to question current strategy.

Performance measurement in public healthcare: a review

The healthcare organization can be described based on three domains (Kouzes and Mico, 1979): policy, administrative management, and professional service. The medical profession is generally acknowledged as having the main influence (Mintzberg, 1993; Etzioni, 1966).
Each domain operates on different and contrasting principles, success measures, structural arrangements, and work modes, and can be seen as conflicting with each other. According to Gustafsson (1987), Swedish healthcare is characterized by an inherent conflict derived from the meeting of strong, traditional control of the professional hierarchy with relatively new administrative management. Consequently, various domains have different demands for management control and how to measure performance.

In the healthcare context, performance measurement is recognized as a method with large utilization possibilities. However, the purposes of practicing measurements vary between different domains (Behn, 2003). At the policy level, much work has been directed toward creating transparency in healthcare systems (Collins and Davis, 2006). On the other hand, new administrative management has developed models such as the Balanced Scorecard (BSC) to integrate measurement into the planning and budgeting of organizations (see, e.g., Otley, 1999). The literature also identifies that professionals use measurement for various purposes of evaluating, controlling, and improving clinical practice (De Vos et al. 2009). These three perspectives are presented further below.

At the policy level, the trend for creating transparent healthcare systems is recognized as a way of creating external pressure and a sense of urgency for change (Elg et al. 2011). Transparency through public reporting of performance measurement is generally acknowledged to help benchmarking (NHS modernization agency, 2003), reward quality and efficiency through various financial incentives (Collins and Davis, 2006), and inform patients (Schneider and Epstein, 1998). Reporting based on external demands or promotion of the organization’s performance to the public arena is also a managerial effect of performance measurement, since the competence and value of the organization is being evaluated in the light of public debate (Behn, 2003).

The accounting and strategy literature stresses links between management control and performance measurement (see, e.g., Chenhall and Langfield-Smith, 2007; Anthony and Govindarajan, 2001; McKinnon & Bruns, 1993). These links are also a central aspect of new administrative management in healthcare, which has been explored in several empirical studies (see, e.g., Aidemark, 2001; Andersson et al., 2000; Radnor and Lovell, 2003; McAdam, Hazlett and Casey, 2005; Chavan, 2009). The findings are consistent. In the Swedish context, the Balanced Scorecard is not perceived as a way of controlling goal congruence when applied to healthcare but as a way of providing a language in a dialogue leading to collaboration and increased consensus about healthcare goals (Aidemark, 2001). Hallin and Kastberg (2002) also showed that the BSC is a new way of describing healthcare, which provides a foundation for discussions on the activities and how to improve it. The BSC applied in healthcare is different from the original BSC model advocated by Kaplan and Norton (1992).

Empirical research into how performance measurement may be used to improve professional clinical practice is rare. One review by de Vos (2009) identified 21 research studies on how quality indicators are applied in improvement efforts. They concluded that effective strategies for implementing quality indicators are unusual. A review by Thor et al. (2007) studied the application of statistical process control (SPC) in healthcare improvement. They identified 57 empirical articles and concluded that SPC is a versatile tool which can help various stakeholders in their improvement efforts. Although giving valuable information about factors or conditions that facilitate the application of SPC, not one of the reviewed articles focused on organization for performance measurement.
Significant research into performance measurement in healthcare has been undertaken in relation to management accounting approaches, but we conclude that the operations management perspective in healthcare is significantly lacking. More specifically, the theory lacks understanding of how performance measurement can be organized to support improvement initiatives in healthcare practices. This problem goes back to the notion that, despite all good intentions in measuring, how to make better use of data remains a question for many practitioners (Neely and Al Najjar, 2006). In line with this argument, Behn (2003) stated that in public organizations, “neither the act of measuring performance nor the resulting data accomplishes anything itself; only when someone uses these measures in some way do they accomplish something” (p. 586). Therefore, from that point of view, the notion “what gets measured gets done” does not seem to hold. Relying on an invisible hand linking measurement of activities to improvement is not possible. A consequence of this assumption is that performance measurement and its related activities need to be organized to become an effective means of improving work. However, what types of organizing activities are needed? This question is of great importance. In their article, “Designing, implementing and updating performance measurement systems,” Bourne and his colleagues pointed out that a “forum is needed to review the measures and ideally to agree on action. To do this, a regular meeting is required, attended by the directors and managers who have responsibility for the performance being measured” (Bourne et al., 2000, p. 761). This paper further elaborates on this statement and shows that these mentioned regular meetings might be of various kinds. In this paper we will show how these various meetings and activities are interdependent and influence each other.

**Analytical framework**

To analyze the activities in which performance measurements are being used, an initial framework including two dimensions is suggested. While the dimension of regulation and exploration is related to the purpose of using performance measures, the dimension of “ad hoc” versus continuous is related to the frequency of the activities, including performance measurement. These are described in greater detail below.

It is assumed here that organizations in dynamic environments use performance measurements both to *regulate* existing processes and activities to meet today’s demands and to *explore* new challenges related to future changes in the environment. The dimension of regulation and exploration departs from March’s (1991) investigation of the relationship between exploration and exploitation in organizational learning. From a performance measurement perspective, exploration refers to activities (including performance measurement) that encourage or lead to the search for new ideas, innovations, experimentation, and other opportunity-seeking behavior. As proposed in prior research, regulating activities that involve performance measurement are primarily related to top-down knowledge inflows of managers. The explorative activities, including performance measurement, are generally related to bottom-up inflows of knowledge. Both regulating and explorative activities that involve performance measurement exist in organizations. This paper assumes that the achievement of an appropriate balance between the two dimensions is essential for the use of measurement systems in improving healthcare practices.

Organizations use measurements to different extents depending on the purpose of the measure or phase of development (cf. Kollberg, 2007). Activities including performance measurement that *continuously* occur in an organization are regularly related to measures that have been used over a long period. Continuous performance measurement recurs
frequently in various work settings. This typically takes place in management meetings and other settings that are part of an organization’s managerial work (Elg, 2001). However, activities related to new measures occur as unplanned or “ad hoc” events as a response to a specific problem or event (Elg and Kollberg, 2009). This paper assumes that both continuous and ad hoc activities, including performance measurement, exist in organizations and that they are used for different purposes in driving healthcare improvements.

**Materials and method**

This paper is based on a single in-depth case study. This design was chosen because of the need to study the usage and details of performance measurement; the design presents the opportunity to research events in their natural context (Dul and Hak, 2008). Voss et al. (2002) distinguished between different purposes with case study research: exploration, theory building, theory testing and extension/refinement. The present study aims to explore the phenomenon of using performance measures in healthcare. In addition, the research aims to contribute to the field of operations management as it shows the role of performance measurement in improving clinical practice. The study is based on sampling of a case that can intensively shed light on the central problems of how to utilize performance measurement for driving improvements in clinical practice (Miles and Huberman, 1984).

The generalization striven for by this paper is analytical rather than population based. Yin (2009) pointed out that for an analytic generalization, the investigator is striving to generalize a particular set of results to a broader theory. Accordingly, the aim in this paper is to analytically show the various ways in which performance measurement can contribute to improvements in healthcare practice. Of course, the goal is not to analyze how organizations work with performance measurement but rather to show that various sources exist—more or less efficient—that will influence how the practice of performance measurement will function in organizations.

Critical Incident Technique (CIT) (see Flanagan, 1959) has been used to identify critical, positive events within a healthcare unit that has an established and recognized use of performance measurement in its everyday work. The healthcare unit was sampled according to the intensity criterion (Miles and Huberman, 1984). Importance was given to its possibility as an information-rich case that manifests the phenomenon intensely but not extremely. As suggested by Flanagan (1959), a critical incident need not be spectacular; that it holds significance is enough. Thus a critical incident can be an event or circumstance that led to an effective or ineffective outcome. The relevance of CIT in the present study is based on experience in previous research in which respondents have difficulties grasping and articulating everyday usage of performance measurement. One way to prevent interviewees from reporting vaguely and summarily rather than specifically and in detail about how the measurements are part of daily work is to let them identify and talk about specific critical incidents (see Miles and Huberman 1984; Kvale 1996 for an overview of this tactic). The present study views CIT as a qualitative interview procedure that facilitates the investigation of significant occurrences of performance measurement (events, incidents, processes, or issues) identified by the respondent, the way they are managed, and the outcomes in terms of perceived effects.

The respondents were asked to elaborate on incidents with respect to (1) what was going on in this situation; (2) the types of performance measurements being used; (3) who was involved; and (4) short-term results and the perceived long-term effects.
Respondents for the study were selected to provide a broad view of what it means to work with performance measurements in practice. The following respondent groups within the orthopedic unit were included: Medical doctors (n=3), nurses (n=3), assistant nurses (n=2), care unit managers (n=2, also with background as nurses), financial manager (n=1), administrative unit manager (n=1), administrators (n=2), the clinical department manager (n=1, also MD), organizational developer (n=1, physiotherapist), and physiotherapist (n=1). In total, 17 respondents were interviewed. The interviews took approximately sixty minutes each and were taped and transcribed. The first and second authors conducted all interviews.

The analytical procedure for data reduction, data analysis, and drawing a conclusion was conducted in four major steps: (1) identification of each incident; (2) coding of the critical incident based on its content and meaning, which led to inductively derived categories of activities including performance measurement; (3) clustering of affinities and relationships between different activities including performance measurement; and (4) comparison and confrontation of the empirically condensed material with the theory.

The empirical context

The healthcare system in Sweden is highly decentralized compared with other countries. Health services are financed and managed by the 20 county councils and regions and 290 municipalities within their respective areas. However, the Swedish Government and Parliament have primary responsibility for health policy on a national level. Over the years, the national government has gradually shifted financial and provider responsibilities to the county councils and the municipalities, resulting in increased decentralization.

The case study is an orthopedic and rheumatologic department located in a county council with about 150,000 inhabitants in southeast Sweden. The yearly healthcare budget for the organization is €15 million. The department has 150 employees in nine sections treating both planned and acute patients. Each year, approximately 30,000 patients visit the department and about 3,000 surgeries are carried out. Table 1 presents examples of frequently applied performance measurements in the department.

Table 1. Examples of frequently applied performance measurements in the department.

<table>
<thead>
<tr>
<th>Category</th>
<th>Performance measurement</th>
<th>Origins</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient</td>
<td>Proportion of dissatisfied patients regarding:</td>
<td>Internally, managerial</td>
</tr>
<tr>
<td></td>
<td>(a) information</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(b) participation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(c) trust</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(d) drugs</td>
<td></td>
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<tr>
<td></td>
<td>(e) pain level</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Satisfaction with surgery (a) directly after, and (b) after one year</td>
<td>Internally, managerial and professional</td>
</tr>
<tr>
<td>Professions</td>
<td>Staff satisfaction</td>
<td>Internally, managerial</td>
</tr>
<tr>
<td></td>
<td>Competence</td>
<td>Internally, managerial</td>
</tr>
<tr>
<td></td>
<td>Sick leave</td>
<td>Internally, managerial</td>
</tr>
<tr>
<td>Processes</td>
<td>Patient safety: (a) infections, (b) risk analysis, (c) hygiene.</td>
<td>Externally, policy</td>
</tr>
<tr>
<td></td>
<td>Waiting time for (a) examination, (b) surgery.</td>
<td>Externally, policy</td>
</tr>
</tbody>
</table>
Results

The first research question is, “What types of activities are related to performance measurement in healthcare practice?” Based on this paper’s identification of positive critical incidents of performance measurement (see Appendix 1) and in relation to previous research, six types of activities including performance measurement have been identified. The six activities including performance measurement are interrelated and sometimes overlapping, in other words, one incident can be categorized as an example of several types of activities. This paper further analyzes the interrelations between the activities including performance measurement.

An analysis of 73 incidents shows that at least six types of activities directly or indirectly drive improvement in the clinical department: (1) Continuous follow-up in formal arenas and meetings; (2) Improvement work; (3) Professional efforts; (4) Goal deployment; (5) Reporting based on external demands; and (6) Creating awareness in everyday clinical work; see Table 2 for an overview. Continuous follow-up is the most commonly occurring (31 incidents), followed by improvement work (25 incidents) and creating awareness in clinical practice (21 incidents). These activities are not mutually exclusive. An organizational activity can include several types of roles for performance measurement. However, categorization significantly highlights the types of activities.

Table 2: Identified organizational activities, including performance measurement.
Continuous follow-up in formal arenas and meetings (n=31)

Managers use data as “temperature measures” to increase their knowledge of day-to-day activities. Continuous follow-up of organizational activity is a central concern for managers and professionals in the studied organization. These activities occur in formal arenas and meetings. A total of 31 incidents were identified as continuous follow-up activities. The care unit manager gives an example of a follow-up activity with regard to the knee process.

In a multi-professional process team, we have been working with the knee process and how to make it possible for the patient to leave the hospital soon after operation. We measure over time the number of patients who leave early and the reason for those who did not leave early. The results from the measurements have made it possible for us to make special efforts for those who did not leave early and improve the process to make it possible.

The critical incidents show that continuous follow-up activities are often described as both exploring (analyzing and discussing the output and results) and regulating (that the result should stay at a certain defined level). Continuous follow-up activities play an important role in driving change. Several incidents describe how the staff has seen indications in the continuous follow-up that lead to more specific problem-solving activities (incident nos. 12, 19, 36, 46, 56, and 63) that then lead to improvement activities.

A descriptive example is incident no. 46, in which a peak in infections (a regulating activity including continuously followed performance measurement) triggered investigations such as the staff examined whether anyone carrying the infection could have spread to the patients (exploring measurements for the cause of the peak). The conclusion was that none of the staff carried the infection, but that all of the infected patients were weak with multiple illnesses. The conclusions led to improvement work with nutrition.

Improvement work (n=25)

Performance measurements are also related to improvement work within the studied organization. For instance, the number of incoming referrals is continuously followed up on and several improvement initiatives are related to this measure. According to the administrative unit manager (no. 13):

We continuously keep track of the inflow of referrals and compare these with the doctors’ schedules to identify the need for different activities. Based on the number of referrals, we adjust the schedule of activities of different kinds. The management team keeps track of the measurements, and then several multi-professional process teams work with improvements upon request from the management team.

A typical situation is described in incident 35, in which the hip process team works to reduce the time from fracture to operation of hip fractures. Previously, patients who were often elderly had to wait until the next day for an operation. The number of hours until surgery is measured.

Two interesting incidents stand out (nos. 1 and 9) in which the staff shows a high level of initiative. In incident no. 1, a nurse describes how, when performing a journal study, she found that pre-operation showering was registered in very few of the journals. This finding led to her performing an ad hoc survey over one day in 19 operation rooms over the degree of
registration of pre-operation showers. The survey showed that the patients were showered, but that this activity was not registered. To increase the quality of the journal data, the nurse spread information about the outcomes of the survey to the rest of the staff.

When I performed journal reviews, I recognized that pre-op showers were seldom registered. The patients should shower before the operation and we should register if they have showered in their journal, and this data could not be found in the journals that I reviewed. This fact made me do a survey that tracked all operations in our 19 operation rooms over one day. I asked whether the shower was registered in the patient’s journal, and whether the patient had showered. The answer was that almost 100 percent of the patients had showered, but that we did not track it. The results came yesterday so now my job is to spread the conclusions to the rest of the staff.

This incident can be described as bottom-up, in which the initiative for the activity including performance measurement is driven from the employees, exploring (where the nurse tried to determine the reason for the low share of registered pre-operation showers) and ad hoc (a temporary measurement activity). These incidents can be seen as an indication of a culture in which individual professionals are empowered and feel unconstrained in exploring and driving problem solving in their daily work.

In 11 of the 25 critical incidents related to improvement work, external performance measurement sources were the driver for the improvement activity. These external sources are primary healthcare, national registers, and research reports (nos. 8, 10, 28, 34, 35, 41, 52, 65, 69, 72, and 73).

_Professional efforts (n=7)_

Seven of the 41 incidents are related to situations in which interested professionals identify performance measures in pursuit of an answer to a specific question or experienced problem. These situations are characterized as ad hoc activity based on the professional’s personal need for and efforts to retrieve information. One such example is when a doctor reads a research paper showing that more knee operations are performed than necessary (no. 28). The result was an improvement effort in which the number of operations in the area was decreased over a period of five years.

_Last year, a professional research journal published an article that criticized the number of laparoscopies that were performed in Sweden. As a result, the responsible doctor asked for our numbers to compare with the study. Together, in the professional group of doctors, we looked at our results and discussed the implications. It showed that our numbers corresponded with the national trend of decreasing the number of operations, and this was nice to spread to the rest of the organization._

Four out of seven incidents described regarding the interested professional were also coded as reporting based on external demands (nos. 28, 35, 55, and 73). These incidents describe how a professional group of doctors analyzes reports from national quality registers. Such action has, for example, led to changes in prosthesis and operation routines. All four incidents are described as exploring activities including performance measurement.
Goal deployment (n=9)

Goal deployment processes refer to situations in which performance measurement is being used as a means for strategic management. One example is the hygiene of the staff, which is measured through monthly self-assessments, where the city council management decided on the activity including performance measurement as part of decreasing hospital-connected infections. This type of measurement is based on strategic alignment with county council hygiene goals.

The nine incidents coded as goal deployment (nos. 4, 8, 10, 11, 14, 27, 34, 40, and 52) are clearly continuous (over time) activities including performance measurement with the purpose of regulating behavior of the organization and employees (decided by the management of the county council or the hospital). The financial manager describes how the introduction of the measure of medication costs leads to dialogue between the department manager and the doctors (no. 4).

When I started as a financial manager at the clinic, we had a follow-up system that was hard to understand for the healthcare professionals, so I have tried to increase the use of pictures and charts to increase the understanding of the meaning of the numbers. An important measurement is the cost of medicine where we follow who prescribed what and in what volumes. The follow-up makes it possible for the clinical department manager to have a dialogue with the prescribing doctors based on the patterns of prescribed medicine. For example, when it comes to morphine preparations, we have directions from the county council that we should not prescribe. But even though there are regulations, it became clear in the measurements that these are not followed.

Reporting based on external demands (n=10)

Reporting based on external demands is a central part of the use of measurement. Much of the work involves sending information to other actors for processing and presentation. Comparisons between individual organizations are a common form of publication of the data from these outside actors. The studied organization already uses this information, as explained by the clinical department manager.

We have targets on how quickly we operate on hip fractures, which often affect old people. When I started as a doctor, these patients were waiting, often for more than a day, and now we have learnt that we need to operate within 24 hours. This is followed by the numbers of hours the patient needs to wait in national registers and we have a process team with representatives from all over the clinic who work with this process. We compare ourselves with the other hospitals in the county and if one hospital falls behind in the measurements, they really focus on improving to catch up with the others.

The ten incidents (nos. 28, 32, 35, 41, 55, 65, 66, 69, 72, and 73) coded as reporting based on external demands all describe continuous activities including performance measurement that are requested from external parties such as hospital management and management of the county council or national quality registers. The external parties provide feedback in the form of comparisons with other units on different measures.

These comparisons are described as driving improvement, such as for incident no. 35, in which the national quality registers make possible seeing the results of a certain prosthesis
over time on a large number of patients. This group of doctors was able to discover that certain materials had more re-operations than others (for example, a certain prosthesis should stop being used). One of the MDs describes it as follows: “If it were not for the register it would have taken five more years and several thousand patients before a prosthesis that was shown to be of bad quality in the national registers was exchanged.”

Other examples describe how comparisons between units in the county council (an activity including performance measurement driven by county council management) showed that other units had shorter waiting times (no. 41) and led to re-operations on certain patients (no. 65). These reports including comparisons are described as driving improvement efforts in the unit since they show that reducing waiting times and re-operations in other units was possible.

Creating awareness in everyday clinical work (n=21)

Several incidents (nos. 11, 18, 33) show that self-assessment of hygiene is one example described as creating awareness in everyday work. These activities including performance measurement are coded as a continuous activity with the purpose of regulating a behavior in the organization (for example, not wearing personal clothes or jewelry and always disinfecting your hands). Other examples include measurements of the use of operation equipment (no. 3) and drug costs (no. 4).

In incidents that are not clearly top-down, the measurements were used to persuade and bring attention to certain questions or behaviors (nos. 1, 43, 57, and to some degree 28 and 50). A medical doctor describes an example (no. 57).

In the multi-professional process team that focuses on hip patients, we have been working on simplifying the patient’s process. We made studies on what happens with the patient before he or she arrives to us, and the results showed that many patients had not been through all the preparatory activities before an operation. This created an awareness that we needed to work closer with the primary care to make sure that the patients are prepared in a proper manner when they come to us.

Another example is the nurse in incident no. 1, who found that the pre-operation showers were not registered. The results of her survey were used to create awareness about the importance of journal registration to increase data quality. Another example is incident no. 43, in which a nurse describes how the measurement results give her authority to drive discussions with doctors on topics that are difficult to bring attention to without data. Her actions could be interpreted as activities including performance measurement as a means of empowerment to enable nurses or assistant nurses to use the results and outputs of measurements as arguments when discussing issues with doctors.

The clinical department manager also describes activities including performance measurement as an important part of managing the clinic: “Measuring illuminates issues and increases the pressure for change; it puts focus on things we want to work with and applies pressure to create action.”

Analysis

Analysis of the incidents shows six types of activities that directly or indirectly drive improvement in the clinical department. They also have relationships between one another
that reinforce the importance of measurement. The following section focuses on these relationships and further elaborates on how performance measurement can support improvement activities in healthcare practices.

Through the analysis, the relationships between the organizational activities including performance measurement are seen, as in Figure 1. Starting from the right top, all incidents of goal deployment measurement activities are described as leading to continuous follow-up activities. This result indicates that the strategic targets set by management in the hospital or the county council in areas of, for example, waiting times, infections, and hygiene are deployed in continuous follow-up activities at the clinic.

The next activity from the top (reporting based on external demands) triggers activities related to professional efforts, continuous follow-up, creating awareness in everyday clinical work, and improvement work. Such a result indicates that reporting based on external demands, such as comparisons with other county councils or the use of national quality registers, lead to a wide variety of activities at the clinic.

The most commonly occurring activity in the study, continuous follow-up, is triggered by goal deployment and reporting based on external demands; that is, the continuous follow-up of a clinic’s performance is initiated by forces external to the clinic. However, most continuous follow-up situations are endogenously triggered; that is, measurement activities that are described as driven from inside the clinic. In turn, continuous follow-up activities trigger the creation of awareness in everyday clinical work and improvement work. Given the common occurrence and the triggering of improvements and awareness among people through continuous follow-up activities, such activities may arguably represent the core of the measurement system, providing the organization with valuable information for improving performance. Prior research that shows that measurements are primarily used for follow-up purposes with the primary aim to improve performance support this finding (e.g., Behn, 2003).

In parallel, the exogenous activities of reporting based on external demands trigger professional efforts. In three incidents (nos. 1, 9, and 57), the activity of the interested professional was endogenously driven. The interested professional further triggers both improvement work and the creation of awareness, indicating that professionals have an influence on driving improvement at the clinic and enhancing people’s understanding of performance.

The majority of the incidents for the second most common measurement activity, improvement work, are driven by continuous follow-up. In other words, the most improvement work activities are initiated through the continuous follow-up of measurements. The rest of the incidents describe situations in which the improvement work is driven by professional efforts, creating awareness in everyday work, and reporting based on external demands.

Finally, continuous follow-up, reporting based on external demands, professional efforts, and improvement work triggers the measurement activity of creating awareness.
FIGURE 1 – A model of the relationships between the organizational activities, including performance measurement.

Discussion

The research presented in this paper suggests that performance measurement may be a versatile method for driving improvement in healthcare organizations. The literature review showed that performance measurement has many meanings and origins in healthcare. The review also pointed out that a lack of understanding exists of how performance measurement may be used for improvements in clinical practice. An in-depth case analysis proposes some new insights that will increase the knowledge domain. This discussion further elaborates on the findings from the case study and links these findings to theories on performance measurement. In particular, the discussion focuses on the role of performance measurement as an integrating mechanism between various domains in healthcare. Moreover, the discussion suggests that the value of acknowledging that performance measurement can serve both regulatory and exploratory purposes in healthcare practice. Another important dimension that adds dynamics to performance measurement is the distinction between continuous and ad hoc measurements. Finally, the prerequisites and role of performance measurement to drive improvements is discussed.
Performance measurement as an integrating mechanism among different domains

The literature review on performance measurement in healthcare organizations identified that performance measurement is used for various purposes in the policy, administrative management, and professional service domains. This one-dimensional method of description becomes more complex for this study. In the studied incidents, performance measurement becomes an integrating mechanism that enables one domain’s entrance into other domains.

Integration can be supported exogenously through goal deployment initiatives and reporting based on external demands. The organization’s performance measurement system has a function to handle strategic goal deployment initiatives that are initiated by elected officials and administrative management. Through this process, policy and administrative domains reach and influence the clinical practice level. The organization also has a reporting based on external demands requirement, which leads to the possibility of comparisons with other units. In several ways, this information leads back to the organization’s members through various reports and registers, which is mostly an MD and management activity.

These externally triggered activities seem not to directly lead to changes or improvements in clinical practice. However, the analysis shows that external triggers from outside the clinical context (for example, from other units, national directives, management) play an important role in driving improvements in practice. Prior studies support this finding by arguing that the use of external measures, such as national comparisons, aim to influence improvements in clinical practice (Funck, 2009).

Integration of various domains may also occur endogenously, that is, because of various organizational activities including performance measurement within the organization. For instance, the waiting time performance measurement originating from the policy domain that aimed to create transparent healthcare organizations aided management development efforts to improve accessibility to the department’s services. Through this crossover process, public policy meets the administrative/management domain. Another example is how measurements of drug costs allow the financial manager to discuss the professionals’ rationale for prescriptions and selection of drugs. The findings of this study support research studies that point out that performance measurement provides a common ground for collaboration among various professional groups. The key issue is that organizational members from these respective domains gain access to other areas and understand more deeply the key issues of this other domain. This openness and transparency enables performance measurement at the healthcare practice level to balance the various interests of each domain. As an illustrative example, one nurse said that when a surgery failed, the MD used to go home alone with the patient’s journal to try to understand the various reasons for the failure. When this happened, MDs felt shameful and blamed themselves for a variety of reasons. The nurse continued that, today, when several measurements are available for all involved staff, analyses becomes a teamwork assignment in which different sources of variations are scrutinized. Everyone becomes involved. She concludes by saying that “this really shows the power of performance measurement.”

Performance measurement for exploration and regulation

This study shows that performance measurement can be used for both regulatory and exploratory purposes in managing and improving healthcare practice. These two aspects appear in various forms and with different means. Regulation in the context of performance measurement activity is characterized by creating stability, avoiding uncertainty within the
organization, and standardization. Such regulation is maintained through internal, continuous follow-up and goal deployment of specific performance measurement, which enforces organizational members’ focus on certain organizational phenomena. Many of the identified critical events in the present study are clearly regulatory. For example, continuous assessments make possible identifying patients with a higher risk of malnutrition and failing. Such identification leads to safer care for the patient and increases the certainty of how to treat the patients. Another example is following up on drug costs to maintain cost control over prescriptions, to avoid uncertainty with financial issues, and, at the same time, to enforce standardization of medicines that are acceptable to be prescribed. The study’s results deviate from a general finding in other healthcare studies in which performance measurement is proposed as limited to representing a language for dialogue between different parties rather than to function as a driving force for strategic alignment and controlling goal congruence (Aidemark, 2001). This argument is founded on the idea of a professional service domain in which traditional business management methods of goal deployment do not fit in. The findings of the case study contest this view and contribute to the argument that developing and establishing performance measurement infrastructure that may be used for strategic alignment and goal deployment is definitely possible.

In contrast with the regulatory aspect, performance measurement is acknowledged as useful as a source of new thinking and knowledge development. Healthcare personnel use performance measurement in many instances for exploration. They attempt to determine how to understand specific organizational phenomena by measuring activities, outputs, and outcomes. For instance, external reports on other organizations’ progress and achievements are translated into the healthcare unit through interested professionals who have the ambition to improve various clinical practices. Another example is the nurse who attempted to determine the reason for the low share of registered pre-operation showers through ad hoc measuring. Such an example is a sort of evidence-based management method for problem solving and seeking new ways to organize work (Pfeffer and Sutton, 2006).

Continuous and ad hoc activity

Performance measurement is applied both continuously and in an ad hoc manner within the case organization. Continuously means the various activities that regularly occur over time and have a temporal regularity, including continuous follow-up in management team meetings, activities in clinical everyday work, and reporting based on external demands. Monitoring the system is central to the continuous use of performance measurement, and this monitoring appears in two forms. Continuous follow-up is the most common activity and may be seen as the “core” of the performance measurement system. The staff continuously (for example, monthly, weekly) follows up on the clinic’s measurement system. The measurements in the system are set and described as relatively stable from month to month. This finding indicates that the infrastructure of the reporting/measurement process (for example, what to measure, how to measure, and who is executing the measurement) for the system is rather stable and robust; that is, not easily changed. The infrastructure of the measurement system is also investigated by other researchers (e.g., Landon and Normand, 2008), emphasizing the importance of established measurement processes for successful implementations. Further, people seem to accept the way the measurement is conducted, which may be derived from consistent and long-term use of measurements in the clinic. Prior studies support this finding and show that organizations during initial phases of the implementation of performance measurements often deal with issues related to acceptance of measures and questioning of the quality of measurements (e.g. Elg, 2012, forthcoming). Management (top-down) often sets the continuous follow-up activities, but the results of such
activities (displayed in the corridors of the clinic and shown and discussed in meetings) drive improvement work activities initiated by employees (bottom-up). In this sense, performance measurement can be seen as a tool to empower individuals by helping to initiate and drive bottom-up change. This finding concurs with the conclusion of McAdam et al. (2005) that continuous reviews and improvement processes are needed for performance measurements to be successful. Moreover, this study concurs with the idea proposed by Radnor and Lovell (2003) that usefulness in daily work is of central importance.

As a part of the continuously used organizational monitoring system that triggers new ideas, the professional’s efforts are an important mediator. Such mediation is most commonly represented by medical doctors who read scientific journals, reports, or other reporting based on external demands. The source from which the professionals develop knowledge is located outside the organization, thus providing it with new inspiration, comparisons with other similar departments’ performance, and new trends. Sometimes these activities lead to improvement projects; however, in comparison with other activities (for example, continuous follow-up with internal measuring), this type of activity makes less of a contribution.

Ad hoc activities proposed are those that are initiated temporarily because of either external initiatives or internal improvement efforts. Ad hoc performance measurement may occur over short or long periods of time. They may also be translated into continuous measurement. For instance, hygiene measurement was externally initiated as a strategic national initiative but is now integrated as a continuous measurement in the organization.

**Performance measurement to drive improvements in healthcare practice**

Overall, an improvement in healthcare practice is shown to be triggered by either continuous follow-up activities or professional efforts. Two types of activities were identified in this phase: improvement work and the creation of awareness. Firstly, several measurements drive some kind of improvement initiative, either goal-oriented or focused on problem solving. This finding supports prior research that attributed great importance to measurements to improve products and processes (e.g., Batalden and Davidoff, 2007; Funck 2009). However, compared with continuous follow-up activities, which may be viewed as highly stable, the characteristics of the improvement processes are largely varied in terms of who is taking action, what problem/process/measure is being addressed, and how the improvement is conducted. For instance, the findings show that improvements are triggered from resource and patient-related measures, involve people from different disciplines or management levels, and are goal-oriented and problem-focused.

Secondly, the relationship between awareness in everyday clinical practice and performance measurement has been identified as an important driver for improvement in clinical practice. Goal-deployment processes, discussions in continuous follow-ups, and studies of reports by interested managers result in some of the measurement becoming part of everyday work. As discussed by the respondents, awareness is created in phenomena such as hygiene, patient’s pain, and nutrition of trauma patients, and about changing the way that reality is experienced. This awareness changes the personnel’s body of knowledge, the nature of language, and present trends in the culture (cf. Fishman, 1999). In contrast to specific, well-defined improvement projects, awareness supports changes in a more fluid and undetermined way. These changes may be related to the learning aspect of measurement addressed by, for example, Behn (2003) and Neely and Al Najjar (2006).
Managerial Implications

Healthcare organizations that strive to practice performance measurement as a driver for improvement need to find infrastructures in which it is being integrated into the daily life of organizational healthcare practice. Measurements need to be part of the workplace-based activities as ongoing practice to recognize external influence, monitor the internal organizational system, and analyze deviances. These activities evoke and support the initiation and conduct of improvement efforts, and encourage awareness of specific aspects of organizations. Managers in healthcare organizations should keep in mind that performance measurement can be both exploratory and regulatory in nature. A balance between these two approaches increases versatility and participation in the use of performance measurement.

Limitations of the research

Are the results from this study generalizable? We consider this to be a special case with some elements of general application. This is because the case study provided the ability to give rich and valuable information on how to use performance measurement to drive improvements. Located in a Swedish healthcare region, the studied healthcare department established structures and systems for working with performance measurement. The Swedish healthcare system is also internationally acknowledged for having dense structures for measurement. In addition, the Scandinavian approach to work life promotes employee participation and consideration of social issues. Therefore, generalizing must be done carefully. Giroux and Landry (1998) pointed out that a tendency exists to place too much emphasis on “the formal analysis of information, which is inconsistent with research demonstrating the importance of maintaining a certain degree of informality and ambiguity in organizational contexts characterized by uncertainty and political issues.” In other words, performance measurement may support, guide, and direct action in some situations, whereas in other cases it may not, depending on the contextual embeddedness of its usage. Our case study research highlights this aspect: to enable performance measurements to become a natural part of various everyday activities. However, some aspects seem to be general. The performance measurements presented in Table 1 are relevant and are practiced in other healthcare organizations in Sweden and other countries such as the U.K. and the U.S. The identified organizational activities including performance measurement are also general. They are not specific for an orthopedic and rheumatologic department. In addition, the two pairs of concepts, regulation-exploration and continuous ad hoc, can be used as a means for further analysis of performance measurement in any setting. The identified characteristics of the case organization’s system for performance measurement may be used for normative purposes. That is, the case may serve as an example of how other organizations can develop their own performance measurement system, supported by the categories developed by this study. That the case may be used as an instance for theoretical generalization is emphasized (Firestone, 1993). Additional empirical studies are needed to gain a full understanding of how performance measurement is practiced and should be practiced in the healthcare environment.

In addition, the Critical Incident Technique has some limitations that are important to note. CIT relies on users remembering incidents and that reporting is valid and accurate from their perspective. A tendency also exists for reporters to have a bias toward incidents that happened recently simply because they are easier to recall. Finally, reporters might not be willing to report on certain events or tell the entire story about an incident. To handle these limitations, the results have to be validated through member checking. The descriptive results, especially the categorization of the activities, have been given to members of the sample to check the authenticity of the work.
Future research

Additional research is needed to understand the prerequisites and conditions for utilization of performance measurement in the management of healthcare organizations. One way to conduct this type of research is through comparative studies with business organizations. Two points that may be of importance are stressed here. First, the healthcare system seems to add an aspect that is not part of business performance measurement. Through a strong professional foundation, both efficiency and effectiveness measures are founded in quality registers. These registers represent a significant source of comparative analyses between healthcare organizations and play an important role in controlling and improving healthcare effectiveness and efficiency. Is this an advantage that the healthcare sector has in relation to business organizations? Second, and an important point that separates private organizations from public healthcare, a weak link exists between performance, costs, and revenues. In Swedish public healthcare, patients do not pay for performance. Therefore, linking financial aspects to the customer/patient satisfaction process is difficult. Funding is not related to the single patient; she has only paid a minor fee for using the service but this is not related to the service given to the patient. The distribution of service is needs-oriented rather than based on a patient’s capacity to pay (market-based). Kaplan (2001) supports this observation, and he pointed out that financial measures in non-profit organizations can play an enabling or constraining role. By law, publicly financed Swedish healthcare is directed toward good healthcare given to citizens on equal terms. This goal seems unbalanced with the underlying assumptions of business performance measurement, which emphasize that the goal is to provide value to shareholders (Kaplan and Norton, 2001; Neely 2002).

The future of performance measurement in healthcare seems promising and interesting in many ways. Additional research is needed to understand the specific requirements to practice strategy formulation, goal deployment, and performance measurement. A need also exists to find design concepts for efficient and effective healthcare that incorporate financial measures. Such a need is one of the key issues for the future development of operations management in healthcare.

References


IHI (2003), The Breakthrough Series: IHI’s Collaborative Model for Achieving Breakthrough Improvement. Cambridge, IHI.


SKL (2007), Strategies for increased efficiency (Swedish Association of County Councils and Regions).


# Appendix 1 – Critical incidents of organizational activities including performance measurement

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1</td>
<td>In a journal study it was discovered that few registrations of pre-operation showers were made. This led to a survey performed by a nurse in 19 operating rooms over one day and showed that showers were performed but not registered. The results were spread to increase registrations.</td>
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<td>3</td>
<td>The use of operating equipment is measured and the results over time are displayed in the corridors to give feedback</td>
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<td>4</td>
<td>Follow-up on drug costs are made continuously and form the basis for discussions between the head of the unit and the prescribing doctors.</td>
<td>X</td>
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<td>8</td>
<td>The hospital time after knee operations is measured with the goal to decrease. The number of patients leaving within X days is measured, as is the reason for those who do not leave, the patients are also given a follow-up call after seven days and the return rate because of complications is measured. “We thought that many patients would come back after being sent home early, but now that we measure we can see that that is not the case.”</td>
<td>X</td>
<td>X</td>
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<tr>
<td>9</td>
<td>Many patients where guided to the wrong person by the automatic telephone system. A survey was performed by the staff on the topics of the calls and the system was redesigned based on the results.</td>
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<td>10</td>
<td>The waiting time guarantee states that the patient should meet the doctor for a first visit within three months. The nurses who make the reservations make comparisons between the inflow of referrals and the doctor’s schedules to make them match.</td>
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<tr>
<td>11</td>
<td>The hygiene of the staff is measured through monthly self-assessments on order from the county council. This has led to an awareness of hygiene.</td>
<td>X</td>
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<td>12</td>
<td>Triggered by the difficulty of booking re-visits for emergency patients staff meets each morning to scan journals from the emergency room combined with available times and make priorities.</td>
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<td>13</td>
<td>Rescheduling; adding more operation time based on long waiting lists, to make the “waiting time guarantee”.</td>
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<tr>
<td>14</td>
<td>Reporting of production and cost measurements to management team, staff meetings, informal meetings in corridor and the hospital management creates awareness in the staff.</td>
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<td>15</td>
<td>The manager of the unit reports the volume of patients who wait more than 90 days (the waiting time guarantee) to the manager and the planned actions to decrease the numbers.</td>
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<tr>
<td>17</td>
<td>The secretaries measure their writing volumes to enable actions for efficiency.</td>
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<tr>
<td>18</td>
<td>For hygiene; observations are performed, reported, and discussed. This has resulted in more stations for disinfection.</td>
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<tr>
<td>19</td>
<td>The hospital time after knee and hip operations is measured with the goal to decrease. Representatives for several improvement teams visited Denmark for inspiration and have implemented improvements such as how to make plans for each patient.</td>
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<tr>
<td>23</td>
<td>To create awareness of risk patients, the assistant nurses fill in questionnaires on risk (falling and nutrition). Registered in systems and shown on staff meetings on demand from management.</td>
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<tr>
<td>24</td>
<td>Estimation of patient’s pain (scale 0-10) to adjust medication. Demand from management.</td>
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<tr>
<td>25</td>
<td>Register of nutrition of trauma patients to supervise the health of the patient. Demand from management.</td>
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<tr>
<td>27</td>
<td>A research paper showed that there are more operations performed within an area than necessary. Some changes have been made and then the staff looked at the numbers from five years previous and saw a decrease in operations which was satisfactory.</td>
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<td>28</td>
<td>The county council and the hospital requests measurement reports on a monthly basis from all clinics to enable aggregated reports. The clinic can also add other measurements than the common ones if they like. “We do not find all the measurements useful in our operations, but that is the picture that we send forward, so we often show it on staff meetings so that the staff is aware of what results we report.”</td>
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<tr>
<td>33</td>
<td>The follow-up of hygiene: “The fact that we measure gives us a useful picture to discuss those issues.”</td>
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</table>

Critical incidents of organizational activities including performance measurement refer to various situations and processes in an organization that highlight areas that need improvement. These incidents range from issues in hygiene to patient care, data management, and performance measurement. Each incident is described and categorized to show the specific areas where improvement efforts should be directed. The table above lists several critical incidents with implications for different types of performance measurement and engagement strategies.
<table>
<thead>
<tr>
<th>Page</th>
<th>Text</th>
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<tbody>
<tr>
<td>34</td>
<td>Planning of schedules based on incoming referrals. Triggered by the target of the last two per cents of budget. “Now we control the queues every week, compared to earlier each month to be able to react faster.”</td>
</tr>
<tr>
<td>35</td>
<td>The national quality registers gives the possibility to see the results of certain prosthesis over time on a large number of patients. It makes it possible to discover if your unit has more re-operations on certain material compared to others (then you have to review the way you operate) or if certain materials have more re-operations than others (then you have to stop using certain prosthesis, for example). “If it was not for the register it would have taken five more years and a number of thousand patients before a prosthesis was exchanged.”</td>
</tr>
<tr>
<td>36</td>
<td>The hip process team works with reducing the time from fracture to operation of hip fractures. Earlier the, often old, patients had to wait until the next day for operation. The number of hours is being measured.</td>
</tr>
<tr>
<td>37</td>
<td>Leaving for home early after surgery, target: 80% within five days. At first everybody made an effort, including working weekends, and the numbers looked good. But even though everyone kept on working hard the numbers turned the wrong way.</td>
</tr>
<tr>
<td>40</td>
<td>Comparisons are made between the units within the county council. Two out of three clinics had shorter waiting times which resulted in efforts in the last clinic.</td>
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<tr>
<td>41</td>
<td>The &quot;skin and wound process” team have monthly follow-up on hygiene and infections. The results lead to discussions. The nurse describes how the measurements can enable discussions with doctors.</td>
</tr>
<tr>
<td>43</td>
<td>Monthly reviews of results on staff meetings. &quot;We look at the results, reasons for deviations and discuss our thoughts”</td>
</tr>
<tr>
<td>44</td>
<td>After a peak of deep infections (infections is a continuous measurement), an investigation was made on all the staff. The conclusion was that there was no infection among the staff, all four patients were weak and susceptible for infections. The work lead to changes in nutrition and how to dress wounds.</td>
</tr>
<tr>
<td>50</td>
<td>A follow-up on the rate of documentation of diagnoses in the journals is made on a yearly basis within the county council. The target is 95% and if it is met the unit receives full payment. If less, the payment is less. &quot;We are a big clinic so we have to work hard to manage all the documentation, but we make an extra effort to gain the full payment.”</td>
</tr>
<tr>
<td>52</td>
<td>The national quality registers (hips) reports feedback reports quarterly. Each patient is registered on a separate sheet and reported. The register gives information about which material to operate, on the clinics results compared to others and input for improvement efforts.</td>
</tr>
<tr>
<td>55</td>
<td>Scheduling based on measurements of waiting times, monthly. Plans more operation times on doctors with long waiting lists.</td>
</tr>
<tr>
<td>57</td>
<td>Standardization of the patient process before arriving at the hospital was made after it was discovered that there was a large spread. Follow-ups have shown that more patients participate in preparing activities before operation, for example.</td>
</tr>
<tr>
<td>63</td>
<td>The time patient stays in hospital after operation of a prosthesis is followed continuously. Targeted initiatives have been made to reduce times and now knees are approaching 3 days and hips 5-7 days.</td>
</tr>
<tr>
<td>65</td>
<td>Comparisons are made between the units within the county council. Results showed that the clinic had more re-operations than other units which lead to an analysis. One operator had worse numbers than the others and got education which lead to improved results.</td>
</tr>
<tr>
<td>66</td>
<td>Based on results in quality registers, the doctor can inform patient on risks of infection (0.4%), become dislocated (less than 2 %) and the chance of keeping your artificial limb after 15 years (95%).</td>
</tr>
<tr>
<td>69</td>
<td>There was a report that many patients with lower back pains were not satisfied with the care they were given. This lead to a targeted improvement work where, among other things, the physiotherapists where involved in patients waiting for treatment. The efforts have resulted in improved patient satisfaction.</td>
</tr>
<tr>
<td>72</td>
<td>The improvement team have studied infections in connection to operations and have used the results from a study of incisions (front and back). The work has resulted in changed routines.</td>
</tr>
<tr>
<td>73</td>
<td>The national quality registers gives the possibility to see the results of certain prostheses over time on a large number of patients. A very popular prosthesis proved to break after some years, and then the group of doctors studied the results and changed to other prostheses.</td>
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