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Improving the Efficiency and Effectiveness of Ward Rounds

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Introduction

In Denmark, healthcare systems are experiencing a growing number of demands from all sides: politicians, the public, the actual patients and the relatives. This is not followed by a corresponding rise in number of employees. The results of the employee satisfaction survey from hospitals in the capital region of Denmark[1] show staff experience more stressful workdays due to inefficient work processes than any other reason. As a consequence there is an increasing interest to explore if there are better ways to structure the work processes. Especially lean thinking or fragments of lean thinking have shown some interesting results within the Danish hospitals[2].

When work processes at a hospital ward are explored it turns out that most of them are connected to the ward rounds, especially on medical wards. The rounds are essential for all work at the medical wards, as one professor and consultant said: "The round at a medical ward is the equivalent of the scalpel to the surgeon." One of the problems with the rounds is that they very often tend to last all day, which brings frustrations to everybody involved: patients, clinicians and nurses.

The objective of this paper is to explore if there is a method to structure ward rounds more efficiently than the current system. The quality of the future rounds will have to live up to expectations of patients, nurses, and clinicians. It is obvious for all involved that there is a tight interdependency, a system, between the professionals in their daily tasks. Deming, (1994) described a system as: 'a network of *interdependent components that work together to try to accomplish the aim of the system'*. In order to understand this system Deming provides 'A System of Profound Knowledge', the map of theories to understand the organizations people work in. Key elements that are essential to understand *Profound Knowledge* are the concepts of system thinking, the knowledge of variation, theory of knowledge, and understanding of psychology.

The result of the previously referred survey covering employee satisfaction showed that a majority of the clinicians in one department complained about the considerable time spent on waiting for nurses especially in relation to rounds. As waiting is one of the original seven waste categories in Lean Thinking there was a request to explore if it is possible to reduce the waiting time using the principles of Lean Thinking. Traditionally, rounds started around 9 a.m. and lasted till 2 – 3 p.m. with multiple interruptions. The work of restructuring rounds to become more efficient should therefore include the perspective of clinicians and nurses, and importantly, to also include patients and relatives. Relatives participate in rounds if they are able to attend them.

The purpose of increasing efficiency was to release capacity for clinicians and nurses to enable them to attend to other daily tasks within normal working hours. Furthermore, the patients and relatives wanted to know approximately when they could expect the daily rounds

[1] https://www.regionh.dk/presse-og-nyt/pressemeddelelser-og-nyheder/Documents/Trivselop2014.pdf (report of employee satisfaction in Danish only)

[2] http://www.kompetenceforum.dk/files/forlag/lean_undersoegelse_af_sygehusafdelinger_a5.pdf

in order to be able to structure their days. The management aimed for all rounds to finish around noon each day. Work somewhat similar to this has been carried out but not in a context quite like this specific department, so this was to some degree an experiment.

Take in Figure 1. Departmental Structure here

The department in this paper consists of three units. The patients in one unit suffer from leukaemia and other blood cancer diseases, another unit is for patients who have bone marrow transplants, and the third unit is for patients with other blood diseases. The patients are treated and follow several years in the outpatient part of each unit. They are admitted to the wards when their conditions require hospitalisation and where, especially the patients in the bone marrow unit, they have long stays, often several weeks. Each patient has a contact clinician and nurse, who are responsible for the treatment and care, both as in- and outpatient.

The remainder of this paper is structured with review of relevant literature, followed by the research methods and design, a presentation of the findings, a discussion of the findings compared with the literature, a conclusion, and finally some reflexions on learning points, limitations, and possible next step.

Literature Review

Lean in Healthcare

There is increasing pressure on the health sector, especially hospitals, due to multiple higher demands, the demographic changes and the development of new technologies and treatments. As a consequence the leadership at hospitals are looking for new management inspiration, among these is the possibility to transform lean into the public setting from private enterprises. Jaaron and Backhouse (2010) argue that lean is seen as a useful strategy to meet increasing customer expectations combined with efforts to reduce cost. The guiding principles from Toyota to Lean in service are to ensure low costs through waste elimination and to show respect for their employees by empowerment, teamwork and participation in continuous improvements (Womack and Jones, 2003). Showing respect for people is actually a way to reduce cost as this can reduce staff turnover. Jaaron and Backhouse (2010) point out that as well the direct and indirect cost is affected by staff turnover. When there is low organizational commitment the turnover increases. They found that organizational commitment is closely connected to job satisfaction and quality of service.

Several studies show challenges with successful and failed attemps to implement lean in hospitals. Radnor and Osborne (2012) described the 3Es – economy, efficiency and effectiveness - as the combined reasons for public sector to implement lean. One of the challenges they point out is that the customer and the commissioner of public services are not the same – so what is customer value when it is hard even to identify the customer? A useful term is ‘end-user’.

To understand the special challenges when lean is implemented in the public sector Radnor and Osborne (2012) refer to several studies and have been able to identify four challenges associated with lean;

- Too much focus and reliance on workshops, such as Kaizen blitzes, without the connection of these small-scale projects to a long-term improvement strategy
- A tool-kit based approach to implementation, without an understanding of Lean thinking including the key principles or assumptions
- The specific public sector culture and structures, especially the competing professional and managerial role
- A lack of understanding how central the concept of the customer (or service user) and of service process is to Lean implementation

To meet these challenges Radnor and Osborne (2012) suggest an ideal type of 'process-organisation'. The main objective for this process-organisation is to create value. To achieve this the organisation is structured by interrelated processes gathered to create value instead of, as in a traditional organisation, with a series of functional units or business units. For lean to succeed in public sector Radnor and Osborne (2012) give *5* propositions:

1. Adding value to end-users is the main focus rather than just focusing on efficiency
2. The quality of external service is tightly connected with the quality of internal processes
3. The end-user of public services must be seen as a contributor and co-creator in the process of reforms and service delivery
4. Lean is a holistic theory of service delivery, and cultural change is critical
5. Common sharing of knowledge between professionals and end-users, which must be understood by the professionals.

Porter (2009) suggests to increase value for patients and to integrate the engagement of patients more in their health and health care the outcomes should be measured over the full cycle of care instead of seperately for each event.

The service sector has increasingly tried for the past couple of decades to transform lean from manufacturing into service Radnor and Osborne (2012), Porter and Lee (2013). The sector has seen lean as a means to make bridges between the rise in demand and the limited resources with which to provide the service. For example, in hospitals there is growing awareness and experience with lean as a tool set, as a management system and as a way of thinking to change the traditional way to run hospitals. Wherever lean is used it is important to define lean in terms of the specific goals and objectives for the organisation in question. When management choose to use lean they also choose, not only to do more with less, but also to focus on the value-adding part, namely provide more service to the customer at the same time.

There are major distinctions between manufacturing and service, and the characteristics must be taken into consideration when the value and customer aspect is discussed. Radnor and Osborne (2012) describe three of the charateristics as; the product is often intagible, the production and consumption occur simultanously, and the end-user is very often part, even a major part, of the co-production.

When the end-user must be taken serious as co-partner in service production, this will change the way professionals so far have measured the quality of their work. Blumenthal (1998) found that performance in healthcare traditionally has been measured in terms of departmental outcomes, patient satisfaction, rates of error, waste, unit production costs, productivity etc. Even so the individual clinicians are not accustomed to have measures

applied to their performance. One of the factors might be the almost non-competitive situation in the healthcare market, especially in countries where the vast majority of hospitals are tax-founded. The individual hospital does not have any real domestic or international competitors.

The employees at hospitals are all part of what Drucker (1999) calls knowledge-workers. He claims that the central future challenge is to make knowledge-workers more productive. To do so it is important to identify the factors that determine knowledge-worker productivity. Drucker has identified the following six major factors:

- Agree on what the task is
- Create autonomy for the knowledge workers, so they can manage themselves
- Continous innovation must be part of the work and the responsibiility of the knowledge-worker
- Continuous learning as well as continuous teaching
- Focus on quality as at least as important as quantity
- The knowledge-worker must be seen as an asset instead of a cost.

Drucker calls a large group of the knowledge-workers, technologists, as they do knowledge work as well as manual work. Clinicians and nurses fall into this group. The task of these workers is to satisfy the customer, which in healthcare setting for the vast majority is the patient. This is in line with lean thinking where the first value was identified as 'value seen from the perspective of the customer'. Drucker continues to say that the work has to be restructured and be made part of a system, which concurs with Deming (1994).

As Deming explained, and several studies show, an organization, with all its functions, must be seen as a system. Some organisations like hospitals are very complex and according to Rechel (2010) therefore must be seen as *'immensely complicated processing plants, with thousands of parallel, often complex and interlocking processes'* . Saurin et al. (2013) describe how lean can be understood as an integrated socio-technical system, which is precisely why its implementation is difficult and slow and requires particular styles of management if it should work in a complex system such as healthcare. Teamwork is absolutely critical in complex systems e.g. when decisions are made. Decision-making in hospitals often requires participation from doctors, nurses and patients. Setting the right professional team demands a high level of trust when the most apt decision-makers for each type of decision must be identified. As a result this often implies the reduction of power differentials. This is supported by O'Hare (2008) who describes how the consultant to work successfully has to negotiate, reach consensus and listen to other professionals.

Saurin et al. (2013) describe characteristics of complex systems into four categories;

1. Multiple dynamically interacting elements
    - The system changes over time
    - Interactions are not linear and even small changes can cause dramatic effects in the outcomes

- Interactions happen between closely connected parts so (e.g. tasks, teams, production sequence), so any defect can quickly lead to a consequence and it is difficulty to capsulate those

2. Elements include huge variation
   - The elements are differentiated according to categories e.g. hierarchical levels, division of tasks, specialisations input and output
   - The nature of the relations among the elements exhibits variety in terms of aspects e.g. degree of co-operation, of common purpose and of information shared
3. Unexpected variability
   - Uncertainty, the result of multiple interactions between elements combined with the fact they get information from indirect or inferential information sources, especially in highly automated systems
4. Resilience
   - The system ability to adjust their functioning prior to, during or following changes and disturbances, so that the system can sustain required operations under both expected and unexpected conditions
   - Adjustment of performance to fill eventual gaps of procedures
   - Adjustment of performance guided by feedback to learn from previous events.
   - Self-organisation to enable a complex system to develop or change internal structure spontaneously and adaptively in order to cope with the environment

Saurin et al. (2013) also organised the 14 management principles of Toyota described by Liker (2004) into four categories:

a) Philosophy: management decisions must be based on long-term philosophy

b) Process: establish continuous flow and bring problems to the surface while making flow

c) People and partners: leaders must understand the work, live the philosophy, and expand it to others

d) Problem solving: see and learn from problems to become a learning organisation.

Referring to several studies, Saurin et al. (2013), report operational benefits in hospitals when lean has been implemented e.g. reduced inventories and reduced queues of patients waiting for a doctor. By eliminating unnecessary elements and interactions, lean contributes to reduce unnecessary complexity. Releasing capacity, for example, meant that a smaller number of clinicians were required to carry out routine tasks, freeing up clinician time to provide care to patients with more complicated conditions.

The transformation of lean from private to public and in particular to healthcare has been analysed by Brandão de Sourza and Pidd (2011). They found some of the barriers to implementation are due to the complexity in the sector and some even seemed unique to healthcare. The unique barriers were the way that healthcare professionals perceived lean principles, the specific professional and personal skills, and the cultural issues based on the hierarchy and management roles. Their conclusion was that if these barriers are understood and handled the lean methodology can be successfully implemented. This finding is supported by Davidoff et al. (2015) who found that initiatives to improve quality often are difficult to sustain due to what they have found to be an enormous complexity of the

healthcare delivery system, which includes the social, institutional and political context that are challenging for all involved.

Lean in hospitals has had an impact on the organisational performance, and the professional practice, where it has been implemented, but according to Radnor et al. (2011) less than anticipated. The findings showed that this was connected to the tendency that lean implementation had been about application of a rather narrow range of specific tools and techniques instead of implementation of the entire improvement thinking. As a consequence it turned out that lean was a constellation of activities that were poorly connected. Furthermore, the essential part with customer value were frequently forgotten or left out of the implementation. As Radnor et al. (2011) found the greatest challenge seemed to be the transformation of lean from private to public sector rather than from manufacturing to service.

Patient Flow

Flow in hospitals will, from the patients' perspective, mean that they do not have to wait unnecessarily for examination, tests, admission or discharges. From the clinicians and nurses points of view it is the elimination of all the waiting, which seems to be the major annoying issue.

In most organisations employees agree that flow without waste is a preferable work process. However, it is not that simple to organise for flow. The question around waste is often causing numerous discussions. Bentley (2008) operates with three categories of waste in hospitals: administrative, operational and clinical waste. Administrative operational waste includes duplication of services, inefficient processes, overly expensive inputs, and errors. Clinical waste include overuse of diagnostic test, excessive treatment, inappropriate treatment.

What often makes it difficult to organise for flow is that the many different professions have different perceptions of value and waste. It can be very hard to identify one's own work as a lot of waste. Many professionals in hospitals find it much more understandable to identify demand as either value demand or failure demand as described by Seddon (2005). The ability to create flow is, according to Seddon (2005), continously disrupted by failure demands. Tucker (2003) describes the importance of identifying the right kind of process failure in order to get to the root cause and eliminate the failure. One kind of failure is when an error occurs which can be prevented in the future by e.g. better introduction, guidelines, training etc. The other kind is characterized by something the employee needs for the next step in the process but which is not available at the time and consequently leads to delays and waiting for the involved e.g. blood test results, description of x-ray's etc. This type frequently involves multiple teams, often in different organisational silos which clearly shows that the system is not working together. Tucker (2003) found that what happened when problems are not solved by the root cause was that *'workers experience an increasing sense of frustration, exhaustion and, in some cases, leave the roganization – worn out by the task of swimming upstream.'*

Calderon (2014) describes the benefits from organising for one-piece-flow doing rounds as opposed to the traditional batching. Previously clinicians and nurses had the first batch doing a pre-round where all patients were discussed, a second batching of a round at the bedsides followed this. Finally the documentation and other administrative tasks are followed as a third batch. When a round-in-flow was established this meant improvement in quality as well as in efficiency. The objective of the transformation of ward round in a hospital in US was to

facilitate early patient discharge by the principles of one-piece-flow. The transformation included that clinicians used handheld computers to ensure real-time order writing and documentation as well as focus on the multidisciplinary cooperation.

According to Hicks (2007) the lack of flow is due to the lack of lean information management. Hicks (2007) provides examples where flow is prevented because information has not been generated, cannot be identified, there is an excess of information or it is inaccurate. These examples can all be applied to hospitals of today. These four categories all cause corresponding types of waste, preventing the flow to happen.

Throughout the past decades development and changes in demands from patients and relatives in terms of high level of involvement in decisions regarding treatment and care combined with changed view on authorities forces the systems in hospitals to change. Goldratt (1999) wrote *'every system was built for a purpose'* so when the circumstances change there would be a need to look as whether the system is still the right for the purpose and the goal of the organization. Goldratt (1999) emphasizes the importance of identifying the important constraints and prioritize them according to their impact on the goal.

Behavioural Change

In order to make change happen it is necessary to understand the organisation and the culture within it. The culture in an organisation is strongly influenced by the culture in the country where it is placed. Consequently is it not possible to transform experiences from one country to another or from one organisation to another without a kind of translation into the new context. The cultural differences in various countries have been analysed by the Dutch social psychologist Geert Hofstede and, as shown in figure 2, there are differences between Denmark, UK and US on selected parameters. The low score on power distance and masculinity indicates that the Danes are more inclined to informal structure and high level of employee involvement and consensus culture.

Take in Figure 2 here

The way employees and leaders behave is tightly connected with, and dependent on, the values in the specific country. As the literature for the study is mainly research from UK and US the conclusions will likely differ from observations in Denmark.

Clinicians and nurses do traditionally have great influence on the way they perform their daily tasks. Furthermore, they tend to receive various management consultants advices with great scepticism as anybody with a non-clinical background are considered to have too little knowledge about the specific area to be taken serious. Blumenthal (1998) describes how research in US has shown that clinicians strongly resist real or perceived efforts to curtail their independence, including the behavioural changes required to improve quality.

The readiness to accept changes can be enhanced by putting together the "guiding coalition" (Kotter 1996). . He found that when well-esteemed colleagues are part of the planning team and advocate for the changes the likelihood for changes to be embraced is considerably higher than where the same solutions were presented by external consultants.

Grol et al. (2007, citing Schmidt, 1984), discussed that a cognitive-psychological approach suggests that clinicians do not act rationally but instead decide on the basis of their previous experiences and contextual information. Professionals may interpret or seek information that confirms their beliefs. This is opposed to the way clinicians often act in their fields as researchers where everything must be proven by data.

The leadership approach to changes does play a decisive part in the success of changes. Drotz and Poksinska (2014) found that lean implementation often is so focussed on process improvement that is loses its perspective on people. It is important in healthcare to develop a culture in which the employees are empowered and encouraged to make improvements. Improvements here must focus on better ways to take better care of and give better treatment to patients. In order to do so, it is essential to understand value from the patient's perspective. In many lean applications it is obvious that the sociotechnical aspects unique to healthcare have been overlooked. Both the social and technical elements are needed.

Lean is rooted in two key principles: continuous improvement and respect for people, but as Drotz and Poksinska (2014) shows leaders have all too often missed out these two key principles in favour of tools and fast short-term improvements rather than a cultural long-term change.

Another issue is whether the implementation is done primarily mono-professional or cross-professional. Morrow et al. (2014) have explored leadership roles in NHS in UK and mainly in mono-professional settings with nurses as leaders. The places where implementations were done successfully are where all professions participated. A culture built on cooperation for mutual benefit; some tasks have been transferred between professional groups. The teamwork leads to decreased stress levels. Several employees described lean as a culture built on cooperation for mutual benefits. Furthermore, studies show that when leaders are aware of setting the right team using Roger's (1983) innovation-diffusion theory, which distinguishes between innovators, early adopters, early majority, late majority, and laggers, the entire process is better facilitated. To get key people, who are respected and accepted as role models, as the early adopters benefits the change process.

In a busy environment of a hospital ward, suggestions are made that the physical presence of the patients whilst performing the work takes attention away from the problem itself and instead places focus on the current patient's comfort and safety. Thus, there will be no learning and prevention of the same problem arising again.

Healthcare leaders are usually skilled in their own fields but are not experts in people management. Saurin et al. (2013) support this with findings that contributors to failed lean implementations are lack of manager's ability, experience and knowledge to facilitate the implementation process.

Methodology

A mixed method approach was employed for this study, which involves collecting, analysing, and mixing both quantitative and qualitative data in a single study or series of studies. As Creswell and Plano-Clark (2006) note, the central premise is to combine quantitative and qualitative approaches in order to provide a better understanding of research problems than either approach alone.

Questionnaires were distributed to all staff members in three units of the haematology department and patients and relatives at the department over a two-week period. One of the authors observed the wards rounds in each unit during the two weeks and facilitated improvement workshops with team members. This department was chosen as the management wanted to initiate a project to see if it was possible to optimize the use of resources in the rounds and improve quality from the perspective of patients, employees and relatives at the same time.

Research Setting

This research was undertaken in a haematology department in a major public university hospital in Denmark, which employs approximately 12,000 employees and treats approximately 285,000 patients annually. The department is responsible for the treatment of all haematological disorders in adults according to internationally accepted guidelines and standards and include amongst others:

- non-malignant blood diseases such as, anaemia and haemostatic disorders
- malignant lymphoma
- multiple myeloma
- acute leukaemia as well as chronic lymphoma- and myeloproliferative disorders

Due to the patients' conditions the length of stay can range from a few days to several weeks. Patients are treated in the outpatient unit and as soon as their general conditions allow they are discharged. The treatment and controls can last for several years. A specific named clinician and nurse are appointed as main contact professionals throughout the patient's entire treatment, whether hospitalised or as outpatient. Relatives can participate in rounds whenever it is possible for them to attend. When this is not possible, consultations with the patient, relative, clinician and nurse are scheduled at another time outside of the round. The leaders of the units are senior clinicians and senior nurses with specific knowledge of the treatments and care in their units, all with formal leadership training. The leaders of the clinic are a senior clinician and a senior nurse, both with formal leadership training. They have a thorough knowledge of the conditions treated within their clinic.

Data collection

The participants in this study were department managers, unit managers, clinicians, nurses, patients and relatives. Questionnaires were distributed to all employees, patients and relatives over two weeks prior to the improvement workshop. Seventy questionnaires were completed which equates to 53% response rate. In addition, the department team monitored and gathered data on the time duration of wards rounds and reasons for any unexpected interruptions for a period of two weeks.

The questionnaire contained some generic questions that all participants were asked to complete. Some questions were specific to the role of the participant, for example,

employees were asked for their views on multidisciplinary working, cooperation and interaction with patients and relatives and planning and preparation time for ward rounds. Patients were asked about their knowledge of their treatment plans, whether the ward round met their expectations and how often they saw their named clinician. For relatives views were sought on the levels of participation in the ward round and whether they valued this opportunity and whether overall the round met their expectations. All participants were asked to include suggestions for how the design of the ward round could be improved. All responses were anonymous.

Participants invited to take part in the improvement workshop represented the clinical teams in terms of different professional groups (clinicians and nurses) and levels of experience. 6 workshops were held over a three months period and the main purpose was to design more effective and efficient rounds with the aim to release capacity to other tasks. Value stream mapping was used to visualise the current state map of the existing ward round and for the desired future state, A3s were employed by the team for problem solving. Reflective team sessions with participation of representatives of patients and relatives were held prior to the design of the future rounds.

To ensure the views of all the employees involved in the three units were captured and not just the workshop groups, 'I wonder' books were used to record everyday irritations, good ideas and comments with the phrase "I wonder if [this step] could be [done differently / improved by …]". These books were a non-threatening, non-judgemental way of capturing ideas and suggestions, which were included in the workshops.

Data analysis

Microsoft Excel was used to undertake a descriptive statistical analysis of the quantitative data and to visualise some of the results using for example Pareto diagrams. The qualitative data from the reflective team as well as the 'I wonder'-books were used as a form of reference to measure if the proposed new ward round design represented the views of patients and colleagues.

The A3s were displayed in staff conference rooms for all to comment on to ensure all aspects were included as well as to bring ownership from all staff, not just the members of the workshop group.

When the current state map for each unit was drawn the comparison between the three units showed far less differences between them, than had been anticipated by the staff. Thus it was much less complicated to agree on a common new design, which allowed for slight differences regarding the uniqueness of the patients' conditions in each unit.

Findings

The objective of the pilot was to design a process for rounds that is more effective than the present and at the same time ensures good quality from the perspectives of the clinicians, nurses and the patients. The pilot revealed that even though there is a long-term connection between staff and patients there is some differences in staffs assumption of what patients value and the actual. It also revealed the causes for interruptions more clearly than expected.

Furthermore, the qualitative data gave insight into what is most important for patients while they are admitted.

As 'good quality' of rounds was not even described it raised a need to clarify and agree on that. From questionnaires to patients, relatives and staff it was possible to identify what characterises a 'Good Round'.

The characteristics of a good round are defined as:

- Takes place at a scheduled time
- High level of involvement of patients
- Discretion and undisturbed
- Continuity of professionals
- Everything around one patient is finished before next patient
- Involvement of relatives – especially at long-term hospitalization
- Happens at least twice a week for the individual patient

The daily rounds are supposed to begin around 9am and the nurses have prioritized the order of the patients. The prioritization is done from the patient's current condition but there is no actual standard to prioritize from. The clinicians do not have any influence on this prioritisation, but there seems to be agreement among the professions that this is a sufficient solution. As shown in figure 3 the rounds began any time between 8.55am and 10.19 am. The monitoring took place during two weeks.

Take in Figure 3 here

The clinicians are appointed to do rounds and other tasks at the inpatient unit on some days, whilst on other days the entire time is spent at the outpatient unit. Great effort is done to ensure patients always see their contact clinician in the outpatient unit, and when the patients are admitted as inpatient the contact clinician also see them on days where they appointed to rounds.

Each clinician has to check 6 – 9 patients, mainly patients where he/she is the contact clinician. Each nurse is in charge of the total care of 3 – 4 patients each day. The consequence is that a clinician can experience rounds where up to 5 nurses participate with 'her/his' patients, figure 4. The red rings show how many nurses clinician 1 is cooperating with on a round. Likewise, the nurses do rounds with more than one clinician. This causes major waiting time for each other. As a consequence the patients do not know what time the round is or if it is cancelled that day due to acute issues suddenly emerging.

Take in Figure 4 here

While the rounds are going on there are multiple interruptions, which as well affect the quality and experience of the round as the length as shown in figure 5.

Take in Figure 5 here

Due to waiting and interruptions the rounds are lengthy. The length of rounds was measured during two weeks and the finishing time was documented. Only on two occasions were they finished by 12 am. and twice after 3pm which is shown in figure 6.

Take in Figure 6 here

Qualitative questionnaires were given to employees, patients and relatives, in order to design a better process for rounds, which meet the demands from these groups. In these, they were asked for what was of the greatest importance to them. As shown in figure 7 25% want it to remain as it is today, another 25% would like to know the approximate time for rounds. The responses from the relatives on this particular question were that the rounds are okay today but preferably in the mornings.

Take in Figure 7 here

As professionals often assume they know what the patients want, they were asked what they expected the patients value. The result is shown in figure 8.

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Discussion and conclusion

In the pilot the concept of failure demand turned out to be a very useful method to discuss interruptions. It became obvious that some interruptions are always acceptable such as a young clinician needs guidance to handle a difficult, unforeseen situation. The need to answer telephone calls is absolutely critical, but the number of telephone interruptions surprised everybody and made it obvious that a decision regarding this had to be made.

There are interesting differences in what staff expected patients to value and what patients actually reported. This can possibly be explained with the use of Kano's distinction between basic and delighters (Kano et al. 1984). The basic factors are elements a customer expect to be present, and if not the consequence is a dissatisfied customer. Delighters are elements the customer does not expect and which cause delight and pleasant surprise. Over time delighters tend to be basic as customers will begin to expect them.

Staff members consider patient involvement, staff qualifications, well prepared staff as important whereas the patients mainly only wanted to know the approximate time of the round, they were quite content with the other elements of the rounds. As these patients know the staff and know the hospital is highly recognized for highly qualified clinicians and nurses these areas cover the basic needs, and the patients would be dissatisfied if they were missing. Whereas it is important to know the time of rounds and know it is conducted by their contact persons.

Patient and relatives' involvement was considered very important for this department, thus they participated in filling in the questionnaires. Furthermore, there was a session of

reflective team. The reflective team session left the staff very surprised that they had not been able to disguise when they were busy or knew that the patients found it difficult to distinguish between the many nurses they met. If the new design had been implemented without the knowledge of patients' view of value the result would definitely have been different.

Based on the questionnaire data it was evident that the current system where each person completed rounds with 3 to 5 other staff members resulted in unnecessary waiting, followed by annoyance of time wasted.

The new designed process involved:

- Introduction of checklists for clinicians and nurses as described by Herring et al. (2011).
- Prioritizing of patient till next day's round done by the unit managers including setting the right team of contact clinician and nurse. Each patient will get a round at least twice a week, more if the condition requires it.
- Renaming from 'Round' to 'Consultation' as there are so many assumptions and history connected to the word round.
- Establishing rooms for consultation to ensure privacy and improved communication as mentioned by O'Hare (2007). This increases patients' mobility and training as they have to walk to the room, a secondary important win.
- Plan for discharge is made right after admission, and can obviously be altered. This ensures better discharge.
- The phone calls are answered by clinicians who are not actively involved in doing the round.

Two weeks after the implementation, the initial result shows that consultations are finished around noon, which releases time for clinicians to handle other tasks. The main reasons for the time reductions are due to better planning, a more structured approach to give visibility of which patients are in consultation and especially those who are not, and less waiting time between physicians and nurses. This has resulted in a reduction in elapsed time and variability which has immediately noticed by the patients who have expressed satisfaction. The benefit for the nurses is to do consultation with fewer clinicians, but apart from that they have not experienced released time.

As the result from this project is very promising this leads us to reflect on how this can be transformed to other departments. Essential points to be aware of for future departments who wish to embark on this redesign journey are:

- Include cross professionals as well as patients and relatives, as this turned out to be more effective than anticipated.
- Do not expect a quick fix. The duration over several months gave the opportunity to influence the culture and opinion amongst staff not directly included in the workshop group, both the option for all staff to comment as well in the 'I Wonder' book as well

as the possibility to comment on the A3s. As shown by Radnor and Osborne (2012) one of the challenges in lean implementation in healthcare have often been too high reliance on workshops and tools rather than on a change of culture.

- The unanimous conclusion from the leaders and staff involved was that this could not have been done without external assistance. Therefore, an external consultant should facilitate the process.
- Do not underestimate the importance of leadership commitment. Without this the entire transformation will not succeed in the long-term. This is in line with the study carried out by Morrow et al (2014) where they showed the connection between leadership interest in improvement activities to ensure sustainability.

References

Bentley, T.G.K., Effros, R.K., Palar, K. and Keeler, E.B. (2008), "Waste in the U.S. Health Care System: A Conceptual Framework", *The Milbank Quarterly*, Vol. 86, No. 4, pp. 629 - 659.

Blumenthal, D. and Kilo, C. (1998), "A Report Card on Continous Quality Improvement", *The Milbank Quarterly*, Vol. 76, No. 4, pp. 625-648.

Brandão da Souza, L. and Pidd, M. (2011), "Exploring the barriers to lean health care implementation", *Public Money & Management*, January, pp. 59-66.

Calderon A.S., Blackmore C.C., Williams B.L., Chawla K.P., Nelson-Peterson D.L., Ingraham M.D., Smith D.L. and Kaplan G.S. (2014), "Transforming Ward Rounds Through Rounding-in-Flow", *Journal of Graduate Medical Education*, December, pp. 750 - 755.

Creswell, J.W. and Plano-Clark, V. (2011), *Designing and conducting mixed method research*, Sage Publications Ltd., London, UK.

Deming, W. E. (1994), *The New Economics.* Massachusetts Institute of Technology, Cambridge, MA.

Drotz, E. and Poksinska, B. (2014), "Lean in healthcare from employees' perspectives", *Journal of Health Organizaton and Management, Vol. 28., No. 2*, pp. 177 - 195.

Drucker, P. F. (1999), "Knowledge-Worker Productivity: The Biggest Challenge", *California Management Review*, Vol. 41, No. 2 Winter, pp. 79-94.

Goldratt, E. M., 1999. *Theory of Constraints.* North River Press, Great Barrington, MA.

Grol, R.P, Bosch, M.C., Hulscher, M.E., Eccles, M.P. and Wensing, M. (2007), "Planning and Studying Improvement in Patient Care: The Use of Theoretical Perspectives", *The Milbank Quarterly*, Vol. 85, No. 1, pp. 93 - 138.

Herring, R., Caldwell, G. and Jackson, S. (2011), "Implementation of a considerative checklist to improve productivity and team working on medical ward rounds", *Clinical Governance: An International Journal,* Vol.16, No.2, pp. 129-136.

Hicks, B. (2007), "Lean information management: Understanding and eliminating waste", *International Journal of Information Management*, No. 27, pp. 233-249.

Jaaron, A.A.M. and Backhouse, C.J. (2010), "*Lean manufacturing in public services: prospects for value creation",* available at: https://dspace.lboro.ac.uk/2134/10746 (accessed 12 July 2015).

Kano, N. Seraku, N. Takahashi, F and Shinichi, T. (1984), "Attractive quality and must-be quality", *Journal of the Japanese Society for Quality Control* (in Japanese) **14** (2): 39–48.

Kotter, J. P. (1996), *Leading Change.* Harvard Business Review Press, Boston, MA.

Liker, J. (2004), *The Toyota Way: 14 Management Principles from the World's Greatest Manufacturer,* McGraw-Hill, New York, NY.

Liker, J.K. and Meier, D. (2006), *The Toyota Way Fieldbook: A Practical Guide For Implementing Toyota's 4Ps,* McGraw-Hill, New York, NY.

Morrow, E.M., Robert, G. and Maben, J. (2014), "Exploring the nature and impact of leadership on the local implementation of The Productive Ward Releasing Time to Care", *Journal of Health Organization and Management*, Vol. 28, No. 2. pp. 154 - 176.

O'Hare, J. A. (2008), "Anatomy of the ward round", *European Journal of Internal Medicine*, Vol. 20 February, pp. 309-313.

Osborne, S.P. and Strokosch, K. (2013), "It takes Two to Tango? Understanding the Co-production of Public Services by Integrating the Services Management and Public Administration Perspectives", *British Journal of Management,* Vol. 24*,* pp. S31-S47.

Porter, M. E. (2009), "A Strategy for Health Care Reform - Toward a Value-based System", *The New England Journal of Medicine*, Vol. 9 July, pp. 109-112.

Porter, M.E. and Lee, T. (2013), "The Strategy That Will Fix Health Care", *Harvard business Review,* October, pp. 1-19.

Radnor, Z. and Osborne, S.P. (2012), "*Lean: A failed theory for public services?",* available at: http://dx.doi.org/10.1080/14719037.2012.748820 (accessed 07 April 2015).

Radnor, Z. J., Holweg, M. and Waring, J. (2011), "Lean in healthcare: The unfilled promise?", *Social Science & Medicine*, 02 March, pp. 364-371.

Rechel, B., Wright, S., Barlow, J. and McKee, M. (2010), "Hospital capacity planning: from measuring stocks to modelling flows", *Bull World Health Organ*, pp. 632 - 636.

Saurin, T.A., Rooke, J. and Koskela, L. (2013), "*A complex systems theory perspective of lean production",*
available at: http://dx.doi.org/10.1080/00207543.2013.796420
(accessed 20 April 2015).

Seddon, J. (2005), *Freedom from Command and Control.* Vanguard Consulting Ltd., Buckingham, UK.

Tucker, A.L. and Edmondson, A.C. (2003), "Why Hospitals Don't Learn from Failures: Organizational and Psychological Dynamics that inhibit System Change", *California Management Review*, Vol. 45, No.2, pp. 55 - 72.

Womack, J. and Jones, D. (2003), *Lean Thinking.* Simon & Schuster, London, UK.

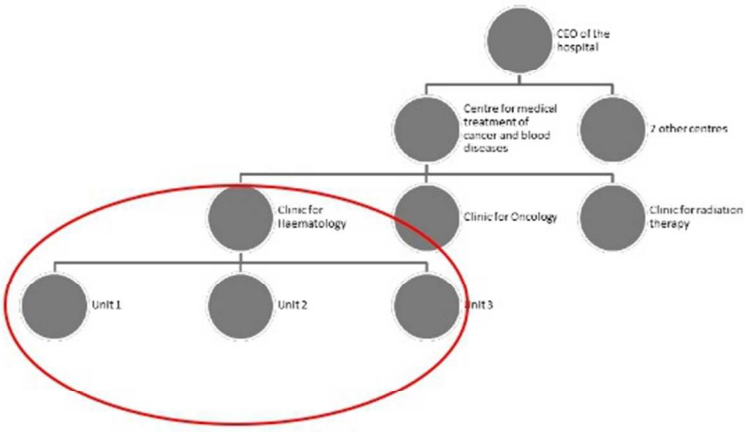

Figure 1. Departmental Structure
254x190mm (72 x 72 DPI)

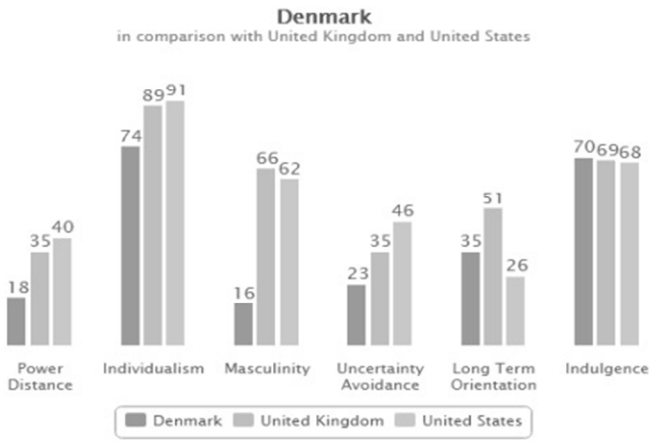

Figure 2: Dimensions on national culture, Source: www.gert-hofstede.com (accessed Dec 2015)

254x190mm (72 x 72 DPI)

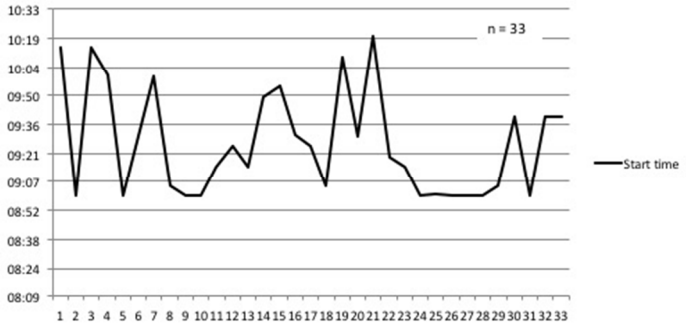

Figure 3. Starting time for rounds during two weeks

254x190mm (72 x 72 DPI)

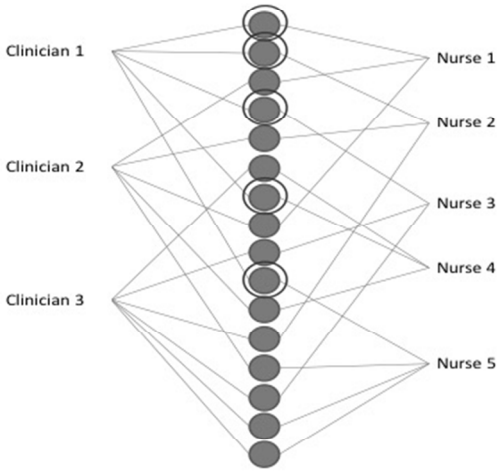

Figure 4. Number of persons respectively that clinicians and nurses cooperates with during daily rounds
254x190mm (72 x 72 DPI)

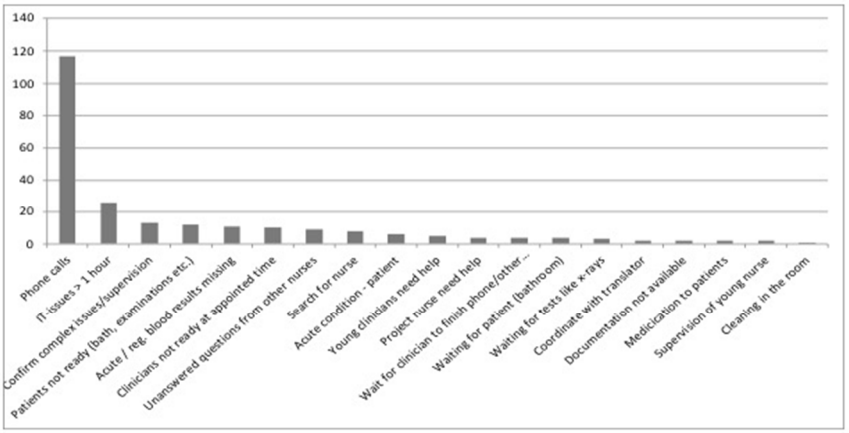

Figure 5. Number and kind of interruptions during rounds
254x190mm (72 x 72 DPI)

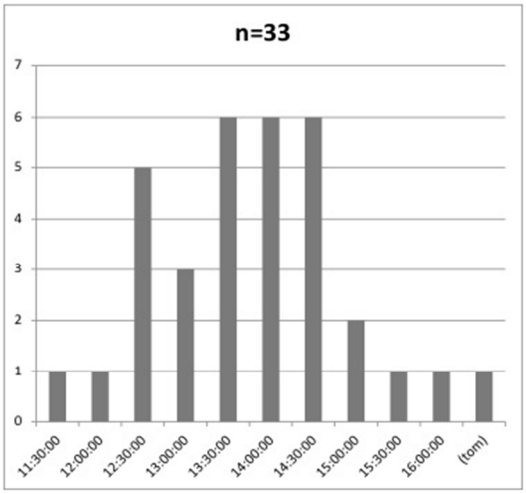

Figure 6. Time for completion of rounds
254x190mm (72 x 72 DPI)

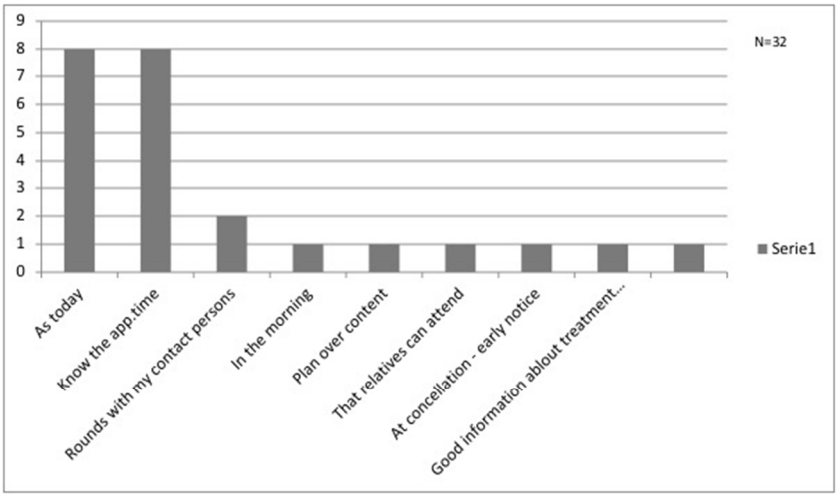

Figure 7. What the patients' value
254x190mm (72 x 72 DPI)

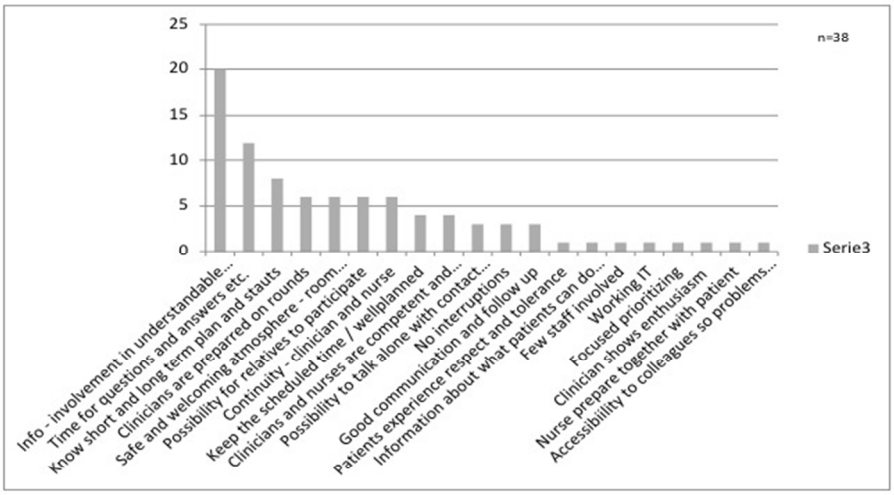

Figure 8. What staff expect that the patient values
254x190mm (72 x 72 DPI)