Laralex Hospital Case Study

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Executive Summary

A part of the Southeast Medical Care Group, Laralex Hospital provides patients with a comprehensive range of services, including maternity, emergency, cardiac care, diagnostic testing, and medical imaging. They contract with an independent organization to collect hospital data. This organization also gathers information from other participating hospitals, and makes performance comparisons. Larex Hospital also works with another firm that analyzes data from patient satisfaction surveys.

This process of data collection and analyzing is done to manage the hospital systems and also to maintain accreditation. However, analyzing performance by comparing each quarter and also comparing the data with other hospitals is not giving Larex the full picture. Because this performance oriented system does not account for normal fluctuations, cannot effectively differentiate a pattern of change, and does not provide output quick enough to take prompt action.

Thus this report is going to propose a different system of analyzing data that will eliminate these issues. In this report I have taken data from the latest benchmark report and analyzed it using P charts and Shewhart interpretation rules. This analysis has revealed that out of all the areas of concern, only the Cesarean Sections and the patients leaving the ED prior to treatment areas are showing instability. This paper is also going to focus on how changing our system of collecting and analyzing data will help with the hospital accreditation. It will also discuss the challenges of implementing this new system so we can prepare accordingly.

Introduction

Laralex Hospital's most recent quarterly benchmark analysis (that also compares Laralex's performance data to its peer group of hospitals) shows that the rate of hospital-acquired infections, x-ray report discrepancies, and unscheduled readmissions numbers have increased form the last quarter. This has concerned the Vice President of Quality Assurance and Risk Management. This report is going to look into those areas more closely and will reveal if the increases mentioned are just random variation in data or a trend that needs to be taken into consideration.

Current Problems and Approach

Laralex Hospital currently employs an external performance benchmarking system that is widely adopted by other healthcare facilities. The system analyzes the hospital's performance quarterly and compares it with similar organizations within a peer group.

However, this approach has several limitations that make it difficult to obtain reliable feedback on the hospital's actual situation. Firstly, the system cannot distinguish between expected variations and patterns caused by change. Secondly, the collected data fails to differentiate between normal fluctuations and anomalous trends. Finally, the quarterly assessment frequency is inadequate for a proactive quality approach that requires a prompt response to potential issues. These problems result in its analysis focusing only on analyzing the surface of the performance, but not reflecting whether there are problems with its systems or management, or whether there is a need for improvement based on the data.

The quarterly performance report has highlighted a substantial increase in the infection rate at Laralex Hospital, with a reported rate of 86% higher than its peers. This result could be a

random variation. It is important to note that infection rates can fluctuate due to various factors, such as the number of patients, the location, the equipment, and the absence of employees, which can vary between healthcare organizations. Regrettably, these factors are not presented in the report, which limits the usefulness of the data for the improvement of Laralex Hospital. To identify areas for improvement, Laralex Hospital must conduct thorough research into the factors contributing to the fluctuation rate. Each department should proactively explore the relationship between performance and its underlying causes to identify critical factors that impact patient outcomes. By focusing on these factors, targeted research can be developed to address specific issues and promote continuous improvement in patient care.

Analysis of Process Stability in Five Areas

Based on the latest Laralex benchmarking report, I conducted a quality assessment of the hospital's reported outcomes for the past 24 months of data in the areas of hospital-acquired infections, cesarean section procedures, discrepant x-rays, unscheduled readmissions, and patients who leave the ED prior to treatment. To find the root cause and the pattern of movement in the run chart, I used the P charts method to determine the stability in the trend of these processes.

Hospital-acquired infections, discrepant x-rays, and unscheduled readmissions all showed stable trends over the past two years. Thus the likelihood of a satisfied customer is also unchanged over the past two years. Base on the P chart generated by the data of these three areas, the below findings can be inferred from Figure 1 through 3 :

- None of the data points are below LCL or above UCL
- No 2 out of 3 consecutive points on the same side are between the 2 and 3 sigma limits.
- No 4 out of 5 consecutive points on the same side are between 1 and 3 sigma limits.

- No 8 consecutive points below or above the centerline
- No 10 points are continuous, of the 11 points below or above the centerline.

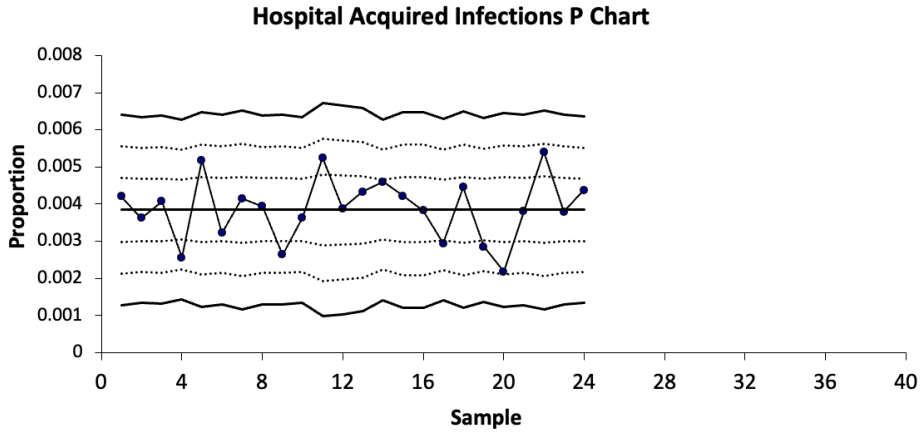

Figure 1: P Chart of Hospital Acquired Infections in Past 24 Months

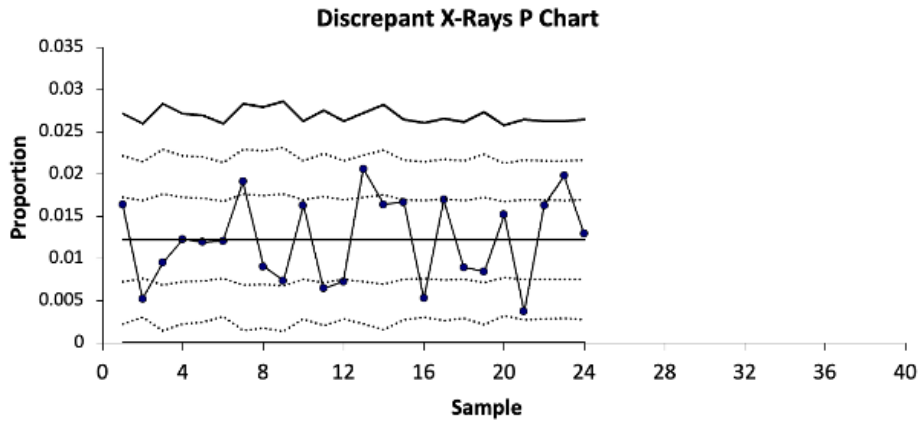

Figure 2: P Chart of Discrepant X-Rays in Past 24 months

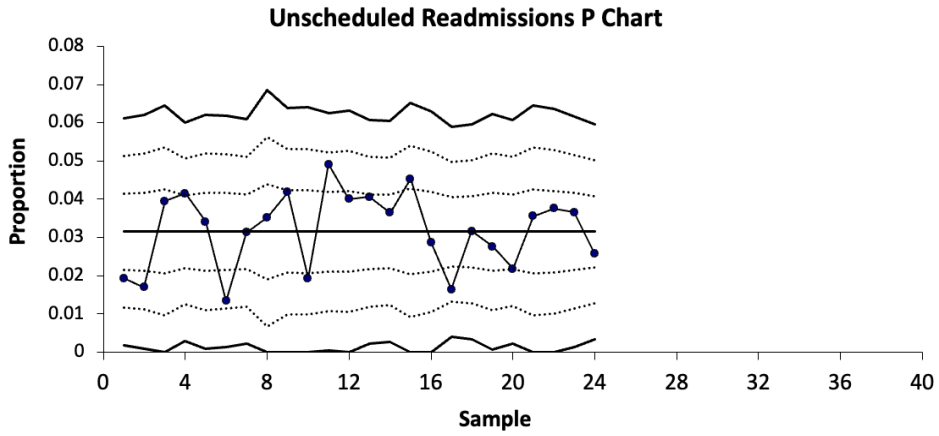

Figure 3: P Chart of Unscheduled Readmissions in Past 24 Months

However, the conditions of cesarean section procedures (Figure 4) and patients who leave the ED prior to treatment (Figure 5) have changed in the last two years. As can be seen from their P charts, the data in these two areas show instability.

Firstly, the P chart for cesarean section procedures, according to shewchart's rule, has 10 of 11 points in a row below the centerline. Therefore, it can be said that cesarean section procedures' condition is unstable, and customer satisfaction has declined in the past two years.

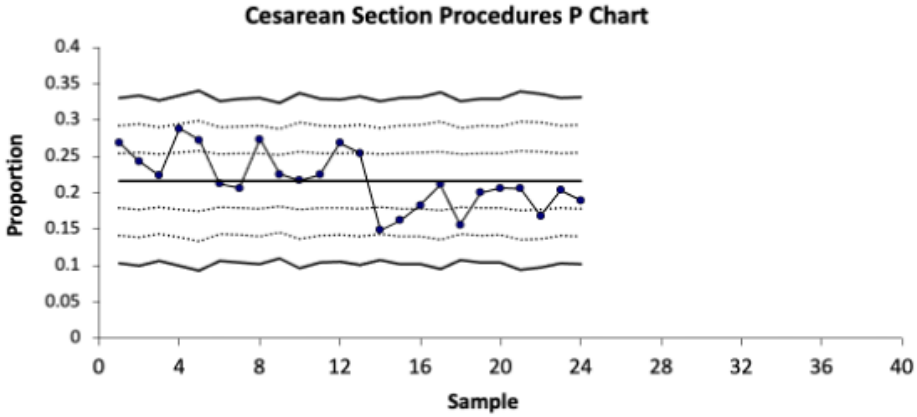

Figure 4: P Chart of Cesarean Section Procedures in Past 24 Months

Secondly, patients who left the ED before treatment were above the centerline at 10 of 11 consecutive points. Therefore, it can be said that patients who left the ED before treatment is unstable, and customer satisfaction has increased in the past two years.

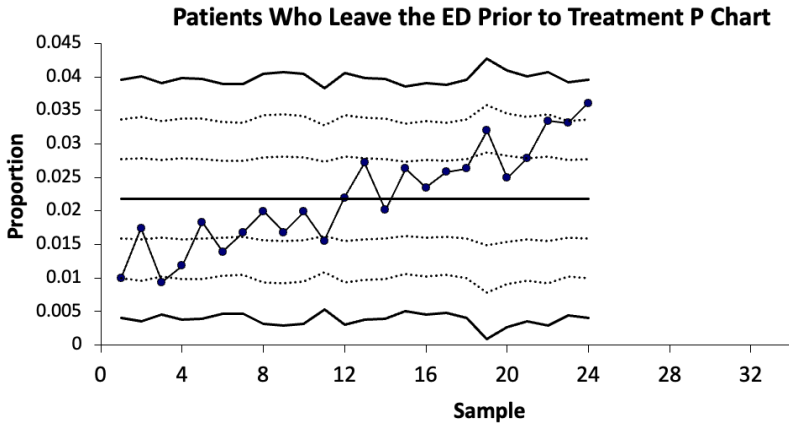

Figure 5: P Chart of Patients Who Leave the ED Prior to Treatment in Past 24 Months

Laralex's Performance and External Benchmarks

Given the external benchmarks, my analysis assumed that the data acquired from these peer hospitals were reliable and authentic. The detailed comparisons are as follows:

For Laralex's discrepancy X-rays data, its process is stable. The 95% confidence interval of this set of data is 1.03%-1.41%, which is consistent with the benchmark level of 1.21% from the peer hospitals. Thus, there is no need to pay extra attention to the x-rays exams.

For the unscheduled readmissions data, the process is stable according to Shewhart rules. Compared to the benchmark of 3.7%, Laralex's 95% confidence interval falls in 2.7%-3.6%, and is slightly lower than benchmark. So, no special attention is needed.

For hospital-acquired infections, the process is stable. The 95% confidence interval of Laralex's hospital-acquired infections rate is 0.35%-0.42%, which is above the benchmark level of 0.25%. Attention should be drawn to this higher infection rate. Investigations and control measures such as disinfection and isolation among patients should be strictly implemented in the hospital.

For the cesarean sections procedures, the process is unstable since there are over 8 points in a row below the centerline. Because it is unstable, comparison with the 19.2% external benchmark cannot be made. A closer look into the sudden drop from sample 13 to 14 would be necessary. Maybe the main cause of sudden drop will be the leave of Dr. Forster. If it is the case, doubts should be casted on whether the current use of C-section procedure is sufficient or not.

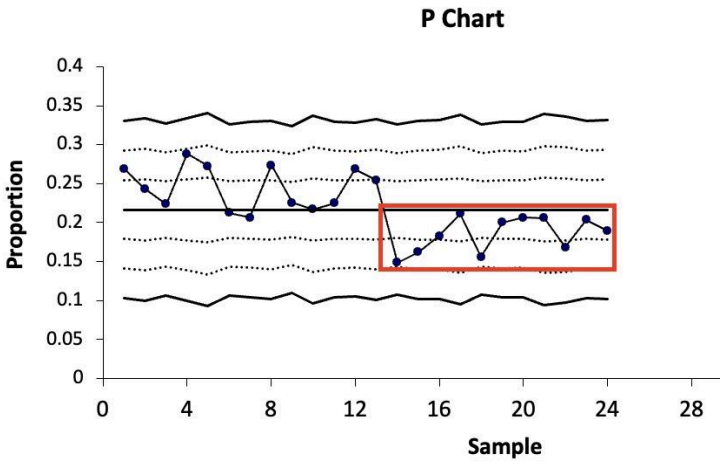

Figure 6: 11 Points in a Row of P Chart for Cesarean Sections

For the data set of patients who leave the ED prior to treatment, the p chart shows that there is an upward trend and the process is not stable due to the 11 points in a row below the centerline. Therefore, there is no need to compare with the 3.2% benchmark. Further data and analysis is needed with regard to the trend in peer hospitals. There may be some reasons like

reduced ED budget and increased patient demand behind the upward line, but more information is needed.

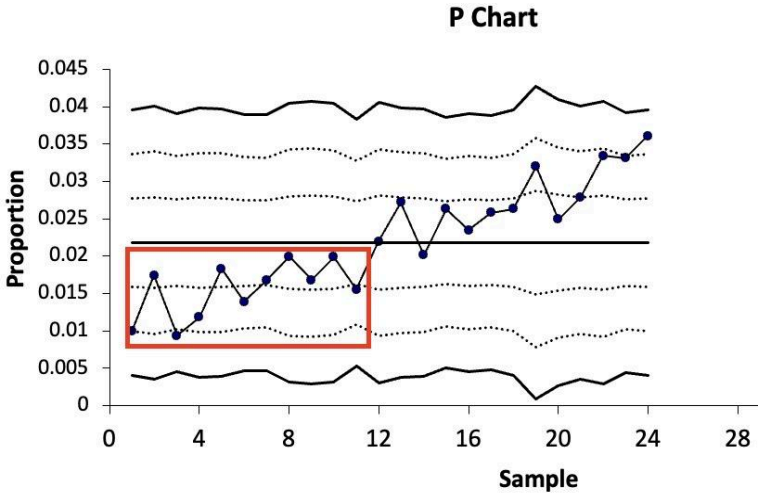

Figure 7: 11 Points in a Row of P Chart for Patients Who Leave the ED Prior to Treatment

Generally speaking, except for the unstable data sets of cesarean sections and patients who leave the ED prior to treatment. Laralex's is performing above average except for hospital-acquired infections. Also, please notice that my analysis is based on the reliability and authenticity of the data from peer hospitals, so conclusions may vary if these data are updated or corrected subsequently.

New System and the Hospital Accreditation

The accreditation for hospitals in the region, including Laralex, is provided by The Joint Commission. They look at the hospital's metrics against a standard set of performance metrics.The use of P charts to report performance data won't have an impact on accreditation, as the accreditation requirements for performance data analysis are not strict. In fact, it is going to

solve the problem of distinguishing real changes vs variations in data, and track pattern and variation over time.

Using the P chart will give a statistically sound approach to compare performance to that of peer hospitals. This forward-looking methodology meets the requirement that performance data be used to take steps to identify the sources of problems. Additionally, The Joint Commission is open to updating their guidelines to reflect advancements in technology, medical practices, and other circumstances, like they did during the Covid-19 pandemic. Laralex can therefore take the initiative to suggest a methodical adjustment for the accreditation procedure, making it more sophisticated and precise.

Challenges of Laralex's improvement program

When implementing process improvement, it is highly likely that barriers and challenges will occur. These are the foreseeable challenges that need to be noticed:

Firstly, the technically oriented staff don't have a solid statistical background, and Laralex's support faculty are mostly not mathematically oriented. However, the Lean Six Sigma requires measuring current performance using metrics and understanding the outcomes of analysis to find out the root cause. Statistical related training will be needed. But current staff may be unwilling to receive the extra training.

Secondly, the culture at Laralex may be inconsistent with the culture needed to implement an effective process. This could be another challenge for the improvement program. Lean Six Sigma at Laralex should include "respect for people", and it should incentivize participation. Though recently the relationship between the ANMU and Laralex has been

contentious, the ANMU sometimes cooperated with hospital leadership regarding working rules, only when convinced that the changes would benefit nursing staff.

The last challenge is the willingness of workers to report mistakes. Accurate data is necessary to the Lean Six Sigma to define and measure the performance. However, due to the fire of a popular manager because of unqualified performance, the image of one mistake leading to loss of a job has impacted the rest of the workers and led to resistance to report mistakes. Without the report of mistakes, it would be impossible to evaluate the performance.

Conclusion

To conduct the process improvement inside Laralex Hospital, unstable data sets of cesarean sections and satisfaction of patients who leave the ED prior to treatment should be first taken a closer look at. The staff in Laralex Hospital must receive enough training especially in statistics before they can conduct an improvement in current procedure. A change in management team and report channel should be done at the outset of the improvement, with both management and staff members taking an active participation. We also need to reach other peer hospitals and data sources for comparisons. The hospital's external stakeholders might need some guidance to help them understand their jobs, and clarifications and notices should be sent to them to boost their cooperation.