Using Six Sigma to Reduce Patient No-Show Rates to Clinic Appointments
John C. Knight, RN, MSN, DNP
University of Michigan School of Nursing, Ann Arbor, MI

Results

Define Phase: two process maps confirmed the no-show workflow improvement opportunity. Estimated missed revenue was $600,000 and non-value added costs were $221,000.

Measure Phase: historical data indicated a 29% actual no-show rate, “out of control” no-shows over time, a -0.54 Cpk metric, and a 26% R² when predicted no-shows were regressed against actual no-shows. The data confirmed that the 29% actual no-show rate was not a good predictor of no-shows.

Analyze Phase:
1. Stakeholder focus groups provided feedback on potential causes of no-shows.
2. Collected data on 15,478 patient visits (N=15,478). Randomly assigned visits to a Learn group (build the prediction model) and a Test group (validate the model).
3. 12 significant factors (α=.05). Binary Logistic Regression to develop regression equation.
4. Learn group R²=56%, Test group R²=52%.
5. Used Probability Loss Diagrams to predict no-show probabilities based on significant factors.

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Background

Adult patient no-shows to clinic appointments are a chronic problem, leading to (1) missed revenue opportunities, (2) costly non-value added activities, and (3) disruptions in care. Many patients at a large Midwest outpatient clinic face significant barriers to receiving care. Leadership believes that the barriers are key factors in the 29% patient no-show rate to clinic appointments.

Purpose

Implement the five phases of the Six Sigma process--Define, Measure, Analyze, Improve, and Control to:
1. Identify the root cause patient factors leading to no-shows.
2. Calculate the probability that a patient will no-show to his or her next clinic appointment.
3. Assign patients to probability risk categories.
4. Develop targeted interventions to overcome barriers to completing clinic appointments.

Methods

Define Phase: “walk the patient care process” to (1) identify the no-show non-value added activities and (2) calculate the non-value added time and costs.

Measure Phase: analyze historical data to measure the impact of the no-show problem.

Analyze Phase: use qualitative and quantitative tools to identify root cause patient factors of no-shows.

Improve Phase: recommend targeted interventions to reduce patient no-shows.

Control Phase: recommend “controls” to prevent backsliding.

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Conclusion

Six Sigma is one effective quality improvement tool that nurse leaders can implement to improve clinical operations. In this improvement project, Six Sigma methods were used to develop a model to predict patients’ no-show probability. While the model is targeted toward an inner-city clinic with lower social economic status patients, other clinics can replicate the process to build a prediction model for their patient population.

Reference