The mission of Ascension Borgess Hospital is to provide patient centered care. In 2018, 562 patients left the Emergency Department (ED) without being seen which is a safety risk for the patients and hospital. This project focused on meeting the mission of Ascension Borgess by improving ED metrics to create more patient centered care.

**Project Objectives**

- **IMPROVE**
  - Patient Experience
  - Safety and Quality
  - Profitability
  - Staff Satisfaction

- **REDUCE**
  - Patients leaving without being seen (LWBS).
  - Patient length of stay (LOS).
  - Ineffective use of staff.

**Methods**

Discrete event simulation was used to test different methods for improving the hospital metrics. In the models, there are 5 different patient entities based on an acuity level using the hospital triage process.

**Base Simulation Model:**

- **Data Collection:** Observation, Time Studies, Hospital Databases
- **Model Creation:** Model 1: Vertical Care, Model 2: Check-in and Triage Changes, Model 3: Proposed Lobby Layout, Model 4: Admit Holding Unit
- **Validation:** Paired two sample t-test on key outputs

**Simulation Outputs:**

- Metrics measuring project objective goals: LWBS, LOS, % Blocked, Resource License Utilization

**Comparing the Models**

ANOVA analysis was used to confirm a statistical difference for the simulation output metrics per acuity.

**Recommendations**

- **Short-Term:** Model 4 (Admit Holding Unit) and Model 2 (Check-in and Triage Changes)
- **Long-Term:** Model 3 (Proposed Lobby Layout)

**Model 4: A root-cause analysis on admission issues throughout the hospital is recommended, as an admit observation unit is a surface solution.**

A final recommended simulation model was created with model 3 + model 4:

- **Yearly Savings:** $1,268,258 in patient resource usage cost, as well as $900,000 from a reduction in LWBS after a 1.8 year payback period.

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