A Pediatric Urgent Care Length of Stay Predictability Model Based on Correlating Physician & Nursing Team Staffing

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Purpose
- To determine whether Volume, Nurse Hours Per Unit of Service (NH/PUS) and Medical Hours Per Unit of Service (MH/PUS) significantly affect daily median Length of Stay (LOS) in pediatric urgent care centers.
- To determine whether there is a significant interaction effect between volume, NH/PUS and MH/PUS to predict daily Length of Stay in pediatric urgent care centers.

Background
Length of the Stay in an Urgent Care is typically the disposition of the consumer if perceived to be too long, managing wait times and facilitating efficiencies to reduce the door to door time is an important value-based initiative. LOS is likely be included on a yearly driven quality dashboard as well as satisfaction survey questions posed to the consumer. Integrated and combined with the AHRQ framework of opportunity with regard to productivity.

Patient Satisfaction with Nursing

Patient Satisfaction with Doctors

Review of Literature
1. During a review of the Enterovirus-D68 outbreak in 2014 experienced at a single children’s hospital within a pediatric Emergency Department and 2 Urgent Care Departments, no significant change in mean of length of stay occurred.
2. Overall, at all study sites, there was a statistically significant decline in median LOS in patients treated exclusively via MDI-spa to ambulacal via nebulizer (MDI-spa, 253.3 minutes, nebulizer, 154.2 minutes; p=0.0005).
3. “Wait times at an urgent care center may vary depending on patient volume.”

Definitions
LOS - Length of Stay is the door entry digital stamp when quick registration starts to the time the patient exits as discharge papers are signed digitally with subsequent escort to the exit door. LOS is represented as the median.

NH/PUS - Worked hours of the nursing team (RN/LPN) per patient encounter as counted by the total number of hours of nursing on shift during the hours of operation divided by the number of patients registered for the hours of operation.

MH/PUS - Worked hours of the physician team (MD/ARNP/PA) per patient encounter as counted by the total number of hours of physician on shift during the hours of operation divided by the number of patients registered for the hours of operation.

Study Design
- 5,846 data elements studied among nine (9) urgent care centers within the Nicklaus Children’s Hospital. Out-patient structure. Three centers span three counties in South Florida. Data elements included: center, daily volume, daily median LOS, calculated worked hours (NH/PUS) & (MH/PUS).

- Generalized linear modeling (fixed effects) was applied to assess effects of volume, NH/PUS, MH/PUS, controlled by year and site on daily median length of stay. Adjusted models using volume, NH/PUS, MH/PUS, site, year, as well as interactions between volume and NH/PUS to predict median length of stay were built, Table 2.

- Descriptive statistics, including mean and quantiles of daily median length of stay, volume, NH/PUS, MH/PUS were calculated, Table 1.

- Medians and quartiles were used due to non-normal distribution of the variables.

Results

- Results from the adjusted effects model showed volume, NH/PUS, site as well the interaction between volume and NH/PUS significantly predicts median length of stay (p<0.03).

- By using median, 25% and 75% percentiles of volume and NH/PUS, the expected daily median length of stay is the lowest when NH/PUS is as high as 1.13 and volume is as low as 0.03.

- By using median, 25% and 75% percentiles of volume and NH/PUS, the expected daily median length of stay is the highest when NH/PUS is as low as 0.78 and volume is as high as 1.42.

- MH/PUS was not significantly associated with daily median length of stay (p=0.03).

Conclusion

- Results from the adjusted fixed effects model showed volume, NH/PUS, site as well the interaction between volume and NH/PUS significantly predicts median length of stay (p<0.03).

References