

Predicting Care Characteristics

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PROJECT DESCRIPTION: The focus for this study is on predicting care characteristics in the emergency department (ED), in particular the length of service and the readmission of patients. The studies are motivated by:

- Unnecessarily long length-of-stay
- Return after 72 hours (4%)
- Overcrowding of the Emergency Department
- Presence of patients with non-urgent medical conditions (~40%)
- Long wait times
- Decreased quality of care and patient satisfaction

PROGRESS TO DATE: Some active projects that we are working on: modeling and optimizing ED clinical and patient flow, dynamic OR scheduling, systems analysis for critical care, and predictive models for patient flow. Work completed was listed in milestones.

POTENTIAL MEMBER COMPANY BENEFITS: Large-scale systems and predictive analysis can result in transformative changes that can

- Understand LOS characteristics
- Analyze and predict return pattern for proactive intervention to improve care and resource anticipation

- Improve patient flow in ED
- Reduce/re-direct non-urgent patients
- Reduce wait times
- Improve quality of care and patient satisfaction

MILESTONES ACHIEVED TO DATE:

- Pre-processed data to generate appropriate sample size for training and blind prediction for feature selection
- Performed predictive analysis using classification model DAMIP (Lee, et al 97-2011).
- Identified discriminatory attribute sets to predict LOS and return in 72 hours with over 70-80% predictive accuracy.
- Presented to our clinical collaborators for feedback and further analysis.