Computer Physician Order Entry and Length of Stay

Laura Kent

A. Study Purpose and Rationale

The purpose of this study is to determine whether the implementation of Computer Physician Order Entry (CPOE) on 6GN of the Milstein Building of Columbia Presbyterian Medical Center affects hospital length of stay.

There is significant controversy related to the benefit of CPOE. Several studies have indicated that, despite the efficiencies that computers bring to modern life, computer driven order entry is more expensive and more time consuming than paper order entry. Despite these claims it seems reasonable to conjecture that if physicians, using computer order entry, can simultaneously communicate a patient order instantaneously to both nursing staff and pharmacy personnel, hospital efficiency might be improved. The benefit to patients is clear: earlier delivery of therapies and interventions, more rapid recovery and hospital discharge. The benefit to hospitals is also clear: decreased length of stay, higher patient turnover, and increased reimbursement.

The hypothesis for this study is that hospital length of stay will be significantly reduced secondary to efficiencies realized by implementing a CPOE system on 6GN at Columbia Presbyterian Hospital.

B. Study Design and Statistical Analysis

The proposed study is a retrospective longitudinal chart review. The study's outcome will be a comparison in hospital length of stay for patients hospitalized before CPOE is in effect and after CPOE is in effect.

Three groups will be analyzed in the study. The first group will be patients hospitalized on 6GN before CPOE goes into effect. The second group will be patients hospitalized on 6GN after CPOE goes into effect. The third group will be a control and will comprise patients on 6GS who are hospitalized over the same time period. The purpose of the control group will be to assess whether there are efficiencies gained in the system over the time period of the study which affect length of stay, but are unrelated to CPOE.

The study will consider several aspects of the hospitalized patients that might affect length of stay including diagnosis, type of liver or gastrointestinal disease, age, gender, ethnicity, social support network, and co-morbidities.

The study will be powered at 80% with a significant P value less than 0.05. A prior study by Tierney, et al measured the difference in hospital length of stay to be approximately 0.90 days. Variations in length of stay differ widely in Tierney's study. It is likely that the variation in length of stay on 6GN is less than in Tierney's study. For the power calculation, an estimate of the variation in length of stay specific to 6GN based on a sampling of prior patients will be used. For purposes of the power calculation, the range in length of stay will be between 3 and 12 days. Based on these assumptions an unpaired t-test calculation reveals the necessary sample size to be approximately 400 patients in each study group.

The study's duration will span approximately 5 months - two months to gather length of stay information prior to CPOE, one month for a run in period for the CPOE, and a subsequent 2 months for data collection of length of stay information with CPOE in effect. The subjects will not be required to stay in the hospital any longer than their medical care requires.

An unpaired t-test will be used to analyze the data. In addition, a multiple regression analysis will be used to assess factors that might affect length of stay.

C. Study Procedure

There will not be any procedures conducted during the study.

D. Study Drugs

There will be no drugs used for the study.

E. Medical Device

There will be no medical device used for the study.

F. Study Questionnaires

There will be no study questionnaires.

G. Study Subjects

The subjects will be patients admitted to the General Medicine II service located on 6GN of the Milstein Building at Columbia Presbyterian Medical Center. These are patients generally admitted with gastrointestinal or liver disease. Of these patients, those with diagnoses including spontaneous bacterial peritonitis, hepatic encephalopathy and those who are admitted for transplant work up will be included. The age of the subjects will be from 25 years old to 75 years old.

Exclusions will include patients who are transferred to the intensive care unit and patients who remain in the hospital greater than one day because of social or placement issues.

There will be no gender or race restrictions.

No vulnerable populations will be included.

H. Recruitment of Subjects

Because this study is a chart review, formal recruitment will not be necessary. Rather, once a subject is identified via the hospital's computer data base as fitting the inclusion criteria, permission will be obtained from the subject in order for that subject to be included in the study.

I. Confidentiality of Study Data

The analysis of the data will be done in such a way as to remove the identity of the patient. Each patient will be assigned a number for identification purposes and only the Principal Investigator will have access to these identifiers. The data will be kept in a locked office on a computer with password protection.

J. Potential Conflict of Interest

There are no known conflicts of interest.

K. Location of the Study

The study will take place on 6GN and 6GS of the Milstein Hospital building at the Columbia Presbyterian Medical Center.

L. Potential Risks

This is a retrospective chart review study and does not involve any risk to patients.

M. Potential Benefits

There are no direct benefits to patients.

N. Alternative Therapies

Not applicable.

O. Compensation to Subjects

There will be no compensation to study subjects.

P. Costs To The Subjects

There will be no cost to study subjects.

Q. Minors as Research Subjects

There will be no minors included in this study.

R. Radiation or Radioactive Substances

There will be no radiation or radioactive substances used in this study.