**The Effect of a Dedicated Liver Service on Length of Stay in Patients Hospitalized with Decompensated Hepatic Cirrhosis**

Jennifer Lai, MD, MBA
PGY2, Columbia Presbyterian Medical Center

Primary Investigator: Robert Brown, Jr., MD, MPH

## LAY ABSTRACT

Study Purpose: This study aims to assess the effect of a dedicated liver service for patients hospitalized with decompensated hepatic cirrhosis on quality of care, using length of stay as a surrogate marker for quality of care.

Study Design: Retrospective cohort

Study Subjects: All patients admitted to Milstein Hospital with one of five Columbia University hepatologists serving as the attending of record. These subjects must have been admitted during the time period from November 1, 2003 through April 30, 2003 or November 1, 2004 through April 30, 2005.

Primary Outcome: Length of Stay

**The Effect of a Dedicated Liver Service on Length of Stay in Patients Hospitalized with Decompensated Hepatic Cirrhosis**

Jennifer Lai, MD, MBA
PGY2, Columbia Presbyterian Medical Center

Primary Investigator: Robert Brown, Jr., MD, MPH

BACKGROUND:
In 1997, Columbia Presbyterian Medical Center established its liver transplant program, which has become the premiere institution within its region for the care of patients with liver disease. As part of this program, a multi-disciplinary team – comprised of hepatologists, transplant surgeons, transplant psychiatrists, and social workers – directs the care of patients with decompensated hepatic cirrhosis admitted to the hospital.

Historically, these patients were admitted to any one of several general medicine services run by housestaff, with the liver transplant team serving as a private consulting team. This was inefficient for several reasons. Communication between the liver team, who made the decisions regarding the patients' care, and the housestaff, who were responsible for implementing the decisions, was often limited to daily progress notes. Therefore, decisions made in the morning would not be implemented until the afternoon, or even, possibly the following day. In addition, this system lacked significant educational benefit for the housestaff, as they did not have ample opportunity to discuss the rationale behind the management decisions.

In June 2004, in an effort to increase direct communication between housestaff and the liver team as well as facilitate housestaff teaching, the Department of Medicine established a general medicine service dedicated for patients with decompensated hepatic cirrhosis. Within this liver service, the multidisciplinary liver transplant team attended daily rounds with the housestaff to discuss management issues and provide directed teaching.

This system is unique to Columbia, and there have not yet been any studies investigating its impact on patient outcomes. Similar systems, however, have been investigated in patients with other chronic diseases, particularly stroke. In a retrospective comparison of 19 hospitals with a dedicated stroke ward versus 31 hospitals with a consulting stroke service, there was a 16% reduction in 30-day mortality for patients admitted to a stroke ward.[1] In a randomized controlled trial of 267 patients with acute ischemic stroke who were randomized to a stroke unit versus a general medicine service with stroke team support, there was a statistically significant reduction in 3-month and 1-year mortality for patients in a stroke unit.[2]

The purpose of this study is to assess the effect of a dedicated liver service on health outcomes of patients hospitalized for decompensated hepatic failure. We hypothesize that a dedicated liver service has led to decreased length of stay, as our surrogate for patient

[1] Birbeck GL. Zingmond DS. Cui X. Vickrey BG. Multispecialty stroke services in California hospitals are associated with reduced mortality. 2006 May 23;66(10):E37-8; Neurology. 66(10):1527-32, 2006 May 23.

[2] Evans A. Harraf F. Donaldson N. Kalra L. Randomized controlled study of stroke unit care versus stroke team care in different stroke subtypes. Stroke. 33(2): 449-55, 2002 Feb.

outcome. If this study confirms our hypothesis, this system may serve as a model not only for other liver transplant centers, but for other chronic diseases such as congestive heart failure, long-term mechanical ventilation, and stroke.

STUDY AIM: To assess the effect of the dedicated liver service on the quality of care of patients with cirrhosis, using length of stay as a surrogate marker for quality of care.

STUDY DESIGN: Retrospective cohort.

PATIENTS: The initial pool of patients will include all patients admitted to Milstein Hospital during the time period from November 2003 through April 2004 compared with all patients admitted from November 2004 through April 2005 with a Columbia University hepatologist attending physician serving as attending of record.

We will exclude all patients who were admitted to a surgical service with one of the five hepatologists as the named attending of record as these patients would not be followed by medical housestaff. We will also exclude all patients who received a donor organ during that hospitalization, as these patients would then be transferred to a surgical housestaff service.

PRIMARY OUTCOME: Length of Stay

STATISTICAL ANALYSIS: An unpaired t-test estimating a difference of 1 day between the intervention group and the control group and using an estimated standard deviation of 4.5 days[3] reveals that 325 patients would be required in each study group to reveal a significant difference ($p < 0.05$) at 80% power.

Allowing for the exclusion of patients admitted with decompensated liver failure who were admitted to a surgical service or received a donor organ during that hospitalization, the initial pool of screened admissions will be 400 patients in each study group. As the liver service admits an average of 2.5 patients per day, 160 days (= 5.3 months) of admission are required to enroll a sufficient number of subjects. Therefore, the intervention group will comprise of all admissions from November 1, 2004 through April 30, 2005, while the control group will comprise of all admissions between November 1, 2003 through April, 30 2004.

In attempt to control for the effect of time on length of stay (as there is a general trend toward decreased length of stay over time), data from both the intervention group and the control group will be compared to admissions to a general medicine service during that same time period. In addition, we will evaluate the trend in length of stay for the equivalent 7-month time periods from 2002 through 2006 to determine the direct effect of the intervention on the desired outcome.

STUDY PROCEDURE: None

STUDY DRUGS: None

[3] This estimate of standard deviation was obtained by taking the range of LOS from the liver transplant service from 5/20/06 – 8/17/06 (excluding outliers of LOS on both extremes), and dividing by four the difference in the upper and lower limits of the range. Thus, assuming a normal distribution of the curve, this estimate captures 95% of the admitted population.

MEDICAL DEVICE: None

STUDY QUESTIONNAIRES: None

RECRUITMENT OF SUBJECTS: None

CONFIDENTIALITY OF STUDY DATA: Data will be obtained from electronic medical records, which are protected by preexisting privacy mechanisms. All data collected for this study will be de-identified and maintained on a password-protected computer.

POTENTIAL CONFLICT OF INTEREST: None

POTENTIAL RISKS: As this is a retrospective investigation of administrative data, this study poses minimal risks to study participants. There does, however, exist a potential risk of accidental breach of privacy. All measures will be taken to minimize this risk.

POTENTIAL BENEFITS: None

LOCATION OF STUDY: Columbia Presbyterian Medical Center

REVIEW OF THE LITERATURE

In a review of 257 hospitals, 19 hospitals had a dedicated stroke service and another 31 hospitals had a multispecialty stroke service available as consultants. Those hospitals with a dedicated stroke ward had a 16% 30-day reduction in mortality (OR 0.84).

Birbeck GL. Zingmond DS. Cui X. Vickrey BG. Multispecialty stroke services in California hospitals are associated with reduced mortality.[summary for patients in Neurology. 2006 May 23;66(10):E37-8; PMID: 16717198]. [Journal Article] Neurology. 66(10):1527-32, 2006 May 23.

In a RCT of 267 pts with ischemic stroke who were randomized to a stroke unit vs a general medicine service with stroke team support, stroke unit care was associated with significantly reduced 3-month (OR 3.6) and 1-year mortality (OR 2.8) with large-vessel infarcts.

Evans A. Harraf F. Donaldson N. Kalra L. Randomized controlled study of stroke unit care versus stroke team care in different stroke subtypes.[see comment]. [Clinical Trial. Journal Article. Randomized Controlled Trial] Stroke. 33(2):449-55, 2002 Feb.

In a RCT of 526 patients undergoing elective orthopedic surgery at an AMC, an interdisciplinary team of surgeons with a medical consult showed a statistically significant reduction in minor complications (ARR -14%) but no difference in LOS or cost.

Huddleston JM. Long KH. Naessens JM. Vanness D. Larson D. Trousdale R. Plevak M. Cabanela M. Ilstrup D. Wachter RM. Hospitalist-Orthopedic Team Trial Investigators. Medical and surgical comanagement after elective hip and knee arthroplasty: a randomized, controlled trial.[see comment]. [Clinical Trial. Journal Article. Randomized Controlled Trial] Annals of Internal Medicine. 141(1):28-38, 2004 Jul 6.