A clinical decision support tool to aid in the management of hospitalized cirrhotic patients

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Background

- The complications from cirrhosis often require hospitalizations that are prolonged and expensive (1.4 billion per year in USA).
- No change in inpatient mortality between 2002-2011 (8.6% and 9.1% respectively).
- Adherence to diagnostic and therapeutic guidelines is low.
Background

- Clinical Decision Support previously implemented in management of variceal bleed.
  - Increased overall optimal care from 41% to 65%
  - Increased prophylactic antibiotic use from 57% to 75%
  - Increased somatostatin analog use from 54% to 76%
  - Decreased 30-day readmission rate from 41% to 13%


Innovation

• First comprehensive standardized order set with associated decision support to guide initial management of hospitalized patients with decompensated cirrhosis.
Aims

• Primary Aim / Hypothesis:

The utilization of a Liver Care Bundle with standardized order sets and decision support at time of admission will improve clinician adherence to guideline driven management of patients with complications of cirrhosis.

• Secondary Aim:

To assess if the Liver Care Bundle decreases length of stay, decreases 30-day mortality, or decreases 30-day readmission rates in patients admitted with decompensated liver cirrhosis.
Methods: Study Design

• Randomized Control Trial with intention to treat analysis.

• Internal Medicine and Gastroenterology & Hepatology house staff will be enrolled and randomized into two teams working in parallel taking care of two separate services:

  Control Team: Will not have access to Liver Care Bundle tool

  Experimental Team: Will receive access and education regarding how to utilize the standard order sets and access the decision support tool

  Patients will be randomized to either team
Liver Care Bundle Design

ORDERS:

- Liver Care Bundle
- Ascites
- Gastrointestinal bleeding
- Nurse: Place 2 Large-bore peripheral IVs (18 gauge or larger)
- Lab: Type & Screen
- Lab: CBC q8hr
- Lab: INR q8hr
- Blood products: packed RBC *
- Blood products: platelets *
- Blood products: fresh frozen plasma *
- Diet: NPO
- Med: pantoprazole 40 mg IV BID *
- Med: octreotide gtt (50 mcg load, then 50 mcg/hr) for 5 days *
- Med: ceftriaxone 1gm IV daily for 7 days *
- Paracentesis, small volume (50 mL) *
  - Lab: Cell Count
  - Lab: Culture
  - Lab: Gram stain
  - Lab: Albumin
- Procedure: Esophagogastroduodenoscopy *

The use of short-term prophylactic antibiotics in patients with cirrhosis and GI hemorrhage with or without ascites has been shown not only to decrease the rate of bacterial infections but also to increase survival. Link to guideline.
## Budget

<table>
<thead>
<tr>
<th>Resource</th>
<th>Purpose</th>
<th>Cost (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programming</td>
<td>Development of code for liver bundle</td>
<td>$15,000</td>
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<tr>
<td>Support Staff</td>
<td>Research aid, support of physicians</td>
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<td>Research Staff</td>
<td>Salary support of research fellow</td>
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<td>Computer equipment</td>
<td>Development tools and software</td>
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<td>Overhead</td>
<td>Miscellaneous</td>
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<tr>
<td><strong>Total Request</strong></td>
<td><strong>Funding source: TBD</strong></td>
<td><strong>$110,000</strong></td>
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</tbody>
</table>
Reflections

- Funding sources easiest part of starting project.
- Institutional buy in was key.
- Engaging stakeholders was difficult and time consuming.