Clinical Bottom Line
Administration of Albumin, within the first 6 hours of presentation, to patients with cirrhosis and confirmed presence of Spontaneous Bacterial Peritonitis will prevent the incidence of Acute Renal Failure and Death.

PICO
P: Adult ED patients with cirrhosis and SBP
I: administration of antibiotics + albumin
C: administration of antibiotics alone
O: prevention of renal dysfunction and death

Background
Spontaneous Bacterial Peritonitis is one of the most common bacterial infections in cirrhotic patients and mortality can reach as high as 30%. Concurrently, renal failure develops in 30-40% of patients with SBP and renal dysfunction in SBP is the most powerful predictor of mortality. Mortality is present in 67% of patients with both SBP and renal failure but in only 11% who have SBP without renal failure. The American Association for the Study of Liver Disease currently recommends albumin infusion to patients with SBP, for prevention of type 1 hepato-renal syndrome. Reviewing these articles serves to establish the benefit of ED administration of albumin.

Trial 1

Validity Rating: low to moderate risk of bias

The Basics
Prospective RCT of 126 cirrhotics with diagnosed spontaneous bacterial peritonitis who were given either cefotaxime alone or cefotaxime + IV albumin

Exclusion Criteria
- Peritonitis (non-SBP)
- Antibiotics within 1 week
- Other infections
- Shock
- GI bleed
- Grade 3 or 4 hepatic encephalopathy
- Cardiac failure
- Organic nephropathy
- HIV any disease affecting short-term prognosis
- Cr >3.0
- Dehydration

Primary Outcomes
- Renal impairment
- Mortality – both in and out of hospital at 90 days

Secondary Outcomes
- Resolution of infection
- Duration of antibiotic use
- Paracentesis for ascites after resolution of infection
- Hospital stay in # of days

Follow Up
7 patients were lost to follow up, 4 in abx alone, 3 in abx+albumin

Results
Study was essentially limited to very stable cirrhotics with SBP who would be floor admits. They found no adverse effects from transfusion of albumin. Renal impairment was 23% lower in the group with antibiotics plus albumin. Mortality was 19% lower in intervention group vs standard group for both inpatient and at 90 days. Overall, there is limited downside (apart from cost) to albumin infusion with potential to impact mortality.

Limitations/Biases
- Use of baseline bilirubin as a predictive marker of mortality
- very specific inclusion criteria

Trial 2

Validity Rating: low risk of bias

The Basics
Meta-analysis of 4 RCTs evaluating albumin treatment in patients with SBP, 288 total patients included. Above trial by Sort et al. included; Xue et al. consisted of 112 pts who received ceftriaxone with or without albumin within 6 hours of presentation; Fernandez et al. included 20 pts who received ceftriaxone with either albumin or 6% Hhydroxyethyl starch at time of diagnosis; Chen et al. included 30 pts who received cephalosporins with or without albumin.
Exclusion Criteria
- Those listed in above study, plus:
  - Age <18
  - “Advanced age”
  - Septic shock
  - Pulmonary disease
  - Beta blocker treatment
  - Therapeutic paracentesis within the preceding week
  - Advanced HCC
  - Ileus

Primary Outcomes
- Renal impairment
- Mortality

Results
- This meta-analysis showed that albumin infusion in patients with SBP decreased renal impairment and mortality
- The pooled ORs were (0.11-0.42) for renal impairment and (0.19-0.60) for mortality
- The addition of 3 RCTs to the data from the Sort et al. trial led to a 37% shrinkage of the CI for renal impairment and 41% shrinkage for mortality

Limitations/Biases
- Only 1 of 4 trials was blinded
- Numerous exclusion criteria may limit this specific study’s application to a general ED population
- Subgroup analysis was not statistically significant enough to risk stratify different SBP pts