Introduction
Catheter-related bloodstream infection (CRBSI) is a common and life-threatening complication of parenteral nutrition (PN) associated with hospital readmissions, loss of venous access, morbidity, mortality, and increased healthcare costs. Ethanol (EtOH) has been shown to be safe and effective in preventing CRBSI in adult and pediatric home parenteral nutrition (HPN) patients. EtOH has inherent bacteriocidal and fungicidal properties, is inexpensive, and has no known potential for resistance.

With ethanol lock therapy, EtOH is instilled into the catheter and allowed to dwell within the lumen of the catheter between cyclic PN infusions. In adults, EtOH is then flushed through the bloodstream before the next HPN infusion is started. Flushing of EtOH is not as common in pediatric patients; these patients typically aspirate EtOH.

EtOH lock therapy is not commercially available. It must be compounded in a sterile environment by diluting 98% sterile EtOH with sterile water to the desired concentration, which is usually 70% (see Figure 1).

The objectives of this study were:
- To examine the efficacy and safety of flushing EtOH into the bloodstream for pediatric HPN patients receiving EtOH lock therapy, and
- To evaluate the number of CRBSI-related hospital admissions before and after EtOH lock therapy was prescribed in pediatric HPN patients.

Methods
A retrospective chart review was completed for all pediatric (up to age 18 years) home PN patients who were receiving EtOH lock therapy in the St. Louis branch of Coram Specialty Infusion Services.

Data collected included:
- Age and gender
- Primary diagnosis
- Weight
- Type of vascular access device and number of lumens
- EtOH lock prescription (compounded by the pharmacy), including start date, strength, volume, dwell time, and type of regimen (aspirate or flush)
- Adverse events associated with EtOH reported by patient, parent/nursing providers, or clinicians
- Number of hospital readmissions for CRBSI
- CRBSI causative organism(s)

Results
Five patients with intestinal failure ages 14 months to 12 years with a history of CRBSI (range of four to seven episodes) were prescribed 70% EtOH lock via single-lumen tunneled silicone catheters.

- EtOH was flushed in four patients and aspirated in two patients (one patient crossed over from aspirating to flushing by MD order).
- No adverse reactions to flushing EtOH were reported by caregivers or physicians.

Four of five patients (80%) had a decrease in the occurrence of CRBSI-related hospital admissions (see Figure 2).
- Case 1 received multiple intravenous (IV) therapies, which increased the number of times the line was accessed. This patient also had the shortest dwell time of all cases, and had a history of compliance concerns with other IV therapies.
- Two of five patients (40%) did not have CRBSIs after EtOH lock therapy was started (see Figures 2 and 3).
- None of the patients experienced further episodes of fungemia or polymicrobial CRBSIs after EtOH lock therapy was started (see Figure 3).
- No adverse events in response to flushing EtOH were reported by caregivers or physician/nursing providers.

Conclusions
- There were no adverse events (or perceived intolerances from patients or family members) with flushing EtOH lock in pediatric home PN patients.
- The majority of patients (80%) had a decrease in the number of CRBSI-related hospital admissions after EtOH lock was prescribed. No patients developed CRBSI from fungemia or a polymicrobial CRBSI after EtOH lock therapy was initiated.

This series supports the existing literature that shows that EtOH lock is a viable therapy for preventing CRBSI. Further prospective trials are warranted.