Background:
- Anxiety in pediatric patients undergoing invasive procedures is common and is associated with adverse outcomes.
- There are limited tools to objectively quantify anxiety in such patients.
- Non-invasive cardiac-index monitoring offers real-time cardiac output measurement.

Objectives:
- To determine if there is a correlation between a validated, qualitative measure of anxiety such as the Numeric Rating Scale (NRS) and cardiac index.

Methods:
- In this single-center, prospective, observational study, children presenting for routine endoscopic evaluation were screened.
- Both the NRS and measurements of cardiac index were obtained at five distinct time points including: (1) patient on stretcher, (2) before and (3) after IV placement, (4) prior to placement in the pre-op holding area, and (5) immediately preceding the induction of general anesthesia. Pearson product moment correlation coefficient (Pearson’s r) was used to test for association between each of the outcomes of interest across all time points.

Results:
- To date, 41 patients were screened from 09/2015-10/2016 and 37 were enrolled in the study with a total planned enrollment of 85. An interim analysis demonstrated that there was an association between several of the indicators of anxiety. While the correlation of heart rate (HR) to NRS did not reach statistical significance (r=0.14, 95% CI -0.01-0.28, p=0.06), there was a statistically significant positive linear association between cardiac index (CI) and NRS (r=0.33, 95% CI 0.20-0.45, p<0.001), see figure 2. The study variables were plotted over time and are depicted in figure 3.

Discussion:
- The reduction of preoperative anxiety in pediatric patients may improve medical experiences, increase cooperation, and decrease agitation upon emergence from anesthesia. Current standard assessment tools for measuring preoperative anxiety are subjective. Our initial findings suggest that cardiac index has a positive, but weak, correlation with the NRS. This finding suggest that cardiac index may serve as an objective and quantifiable surrogate marker of preoperative anxiety, which may be beneficial in assessing and guiding the need for techniques to reduce anxiety.

References: