**Background**

- Anatomical MRI studies suggest that structures utilized in response inhibition (prefrontal cortex and caudate nucleus) are sensitive to ethanol toxicity (1).
- fMRI studies in patients with prenatal ethanol exposure show greater activation across the prefrontal cortical regions and diminished right caudate nucleus activation when performing a response inhibition task(2).
- Ethanol and general anesthetics are pharmacologically and pharmacodynamically similar (3).
- The present study utilized fMRI to evaluate brain activation patterns in children exposed to general anesthesia during early brain development while performing a response inhibition, Go/No-Go task.

**Methodology**

- IRB Approved
- Recruited 15 children ages 10-17 years with a history of a minimum 60-minute general anesthetic exposure between the ages of 0-24 months.
- Recruited 15 age, gender matched, non-anesthetic exposed controls.
- Performed a standard Go/No-Go response inhibition paradigm during fMRI imaging.
- Response time and accuracy during performance of Go/No-Go paradigm were acquired.
- fMRI data processing (FEAT v. 5.98) and statistical analysis (FILM) were completed.

**Results**

- There were no significant differences in response time and accuracy on the response inhibition task.
- There were no significant differences noted in mean voxels of activation in prefrontal cortex and caudate nucleus.
- During Go signal versus NoGo, significant differences in activation noted in cerebellum (p=0.01) (Fig. 1).
- During NoGo versus Rest analysis, significant differences were noted in the corpus callosum and areas of cerebellum (p=0.01) (Fig 2).

**Discussion**

- There was no difference in brain activation in the primary region of interest.
- Our data demonstrate a significant difference in brain activation in areas of the cerebellum.
- These cerebellar findings require further investigation.
- fMRI appears to be a useful tool to evaluate the long-term effects of early anesthetic exposure.

**References**