**Title:** IMPACT OF CARDIAC SURGERY ON THE NEWBORN GUT MICROBIOTA

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**Abstract Body:**

**Background:** Newborn gut microbiota is rapidly colonized with microorganisms from mother and environment; disruption of normal microbiota may lead to disease. Antibiotic exposure, cardiopulmonary bypass (CPB) and intestinal hypoperfusion may impact the gut microbiota and intestinal barrier in patients with congenital heart disease. We describe the impact of cardiac surgery on newborn gut microbiota.

**Method:** Bacteria were collected from daily rectal swabs from newborns in perioperative period. PCR amplified the bacterial 16S rDNA gene, and 250 base paired end sequencing was done using Illumina MiSeq. Microbiome analysis utilized QIIME package to determine the taxa and alpha/beta diversity of organisms.

**Results:** Eleven breast milk fed subjects were enrolled on median two days of life; samples were collected for median nine days. Cardiac surgery occurred on median day five. All subjects received antibiotics, and all but one had CPB. Preoperative microbial composition showed vast diversity across subjects. Analysis of sequential longitudinal samples demonstrated the microbial distributions undergo dynamic shift in alpha diversity (total number/proportion of unique microbes) in 10/11 patients. The microbial composition did not return to original state in 8/11 patients: five showed phylum level changes; 3 had primarily species level differences. An example of change in microbiome diversity is seen in Figure 1.

**Conclusions:** Cardiac surgery, CPB and antibiotics are associated with alteration of newborn gut microbiota - resulting in temporary, dramatic reduction in microbial diversity. Postsurgical microbial composition differs from that of the initial preoperative microbiota sample suggesting a potential long-term microbiome effect. The relationship of these changes to postsurgical morbidity is unknown.