Significance of Enlarging Ventricular Size on Neurosonography in Predicting Abnormal Neurodevelopment in Newborns Followed Through Infancy

**PURPOSE**
To determine the value of both the absolute ventricular size and the rate of ventricular enlargement as measured on neurosonograms (NS), in predicting neurodevelopmental (N/D) outcome in newborns followed through infancy.

**BACKGROUND**
Infants visiting the neurodevelopment clinic are often evaluated with NS. An increasing ventricular size on these exams is often interpreted as a possible predictor of abnormal N/D outcome. Several studies have suggested reference values for ventricular size in the preterm/term newborn population. Longitudinal studies to establish absolute values and rate of expected growth/enlargement of the ventricular system in the post neonatal period through infancy are lacking.

**METHODS**
The patient population consisted of term and preterm newborns who were subsequently followed by the N/D team at our institute between 2006 and 2010. Patients had to have undergone N/D testing at 18-24 months of age to be included in the analysis. Routine NS was performed in the usual manner. The frontal horn width (FHW) of the lateral ventricles was measured as the widest distance between the medial and lateral walls on a coronal image, at the level of the foramen of munro, identified immediately anterior to the choroid plexus in the 3rd ventricle, as depicted. Measurements were obtained by a single investigator using electronic calipers. The study was approved by the regional ethics committee.

**RESULTS**
Of the 271 infants followed at the N/D clinic, 129 patients (72 males/57 females) received neurodevelopment testing at 18 - 24 months and were eligible for analysis. Abnormal developmental outcome ranged from spastic, global delay, autism or death. Over 400 NS were performed between birth and ~11 months corrected age. Each patient underwent an average of 3.4 sonograms (range 1 – 14).

**DISCUSSION**
Ventricle measurements in our normal neonatal population are consistent with previous studies demonstrating a frontal horn width of <3 mm. Patients with an abnormal outcome had an average frontal horn width of >7 mm during the neonatal period. Ventricle measurements in the normal older infant populations are in keeping with the recent publication of Gravendeel and Rosendahl measuring an average of 8.4 mm at 6 - 11 months of age. Patients with an abnormal outcome had an average FHW of 10.5 mm at 6 - 11 months.

**REFERENCES**