

Routine Cranial Ultrasound Screening in Preterm Infants

Purpose:

- To detect brain injury in at-risk infants so that appropriate management can be provided

Background:

Intraventricular Hemorrhage (IVH) and Periventricular Leukomalacia (PVL) are the most frequently documented causes of brain injury in premature infants leading to long term neurodevelopmental disabilities. These injuries are often “silent”, therefore clinical evaluation of these infants may not provide either adequate diagnostic or prognostic information. Bedside Cranial Ultrasonography (CUS) is an excellent screening tool to reliably identify these brain abnormalities and to study the progression of these lesions. MRI is more sensitive, but at present impractical as a screening/routine investigation in this age group.

Infants with Gestational Age < 30 weeks:

- The first CUS should be performed between 7 and 14 days of age and a repeat CUS should be performed at approximately 28 days of age in a clinically stable infant.
- A “discharge” CUS may be repeated between 36 and 40 weeks post menstrual age (or before discharge if the infant is ready to be discharged before 36 weeks) to document status of previous intracranial hemorrhage / PVL and to detect new parenchymal injury. A discharge CUS may be deferred in infants with two normal CUS and a stable clinical course.
- CUS should be obtained regardless of the baby’s age or maturity when clinical signs and/or symptoms suggest that intracranial hemorrhage may have occurred.
- If there is evidence of brain injury in the initial CUS:
 - repeat at weekly intervals until stable
 - Monitor Head Circumference closely
- A Cranial MRI may be obtained in selected infants with the following diagnosis
 - PVL
 - Severe IVH (Grade 3-4)
 - Enlarging ventricles
- May consider consultation with Neurology/Neurosurgery if available prior to obtaining MRI

Infants with Gestational Age ≥ 30 and ≤ 31 6/7 weeks:

- CUS is indicated in this group between 7 and 14 days of age or earlier in the following clinical circumstances
 - Hemodynamic instability
 - Significant drop on Hemoglobin
 - Thrombocytopenia or evidence of coagulopathies
 - Seizures
 - Persistent apneas
 - Resuscitation/Cardiopulmonary support out of proportion to GA
 - Low Apgar scores (less than 5 at 5 minutes)
 - Pneumothorax
 - Persistent metabolic acidosis
 - Significant intrauterine growth restriction (Birth weight less than 1000 grams)
 - Suspected/proven chorioamnionitis
 - None or inadequate antenatal steroids
 - Multiple Gestation (except Di-Di Twins)
 - Mechanical ventilation for >48 hours after birth

Reviewers:

Created by	Department	Creation Date	Version Date
AAH NICU Standardization Committee	Pediatrics	January 2019	Jan 2024

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References

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2. Sewell EK, Andescavage NN. Neuroimaging for Neurodevelopmental Prognostication in High-Risk Neonates. *Clinics in Perinatology*. 2018 Sep;45(3):421-437. Epub 2018 Jun 18.
3. Hand IL, Shellhaas RA, Milla SS; Committee on Fetus and Newborn, Section on Neurology, Section on Radiology. Routine Neuroimaging of the Preterm Brain. *Pediatrics*. 2020 Nov;146(5): e2020029082. doi: 10.1542/peds.2020-029082. PMID: 33106343.

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