

# NEONATAL CRANIAL ULTRASOUND

## Neonatal Cranial Ultrasound

**Objective** To ensure that all staff follow correct procedure for ultrasound evaluation of the neonatal brain.

**Responsibility** All sonographers, trainee sonographers, registrars and radiologists performing paediatric ultrasound examinations.

**Frequency** For all neonatal cranial ultrasound examinations as requested by a clinician and subsequently prioritized by a radiologist.

**Procedure** The following table describes the process to be followed for the ultrasound examination of the neonatal brain.

Prior to examination:	
1	Angle the cot/incubator to make room for you and your machine after checking with the infant's nurse.
2	Dim the overhead lights and close blinds.
3	Clean probes.
4	Ensure correct hand washing technique is carried out.
5	Get comfortable by adjusting both the height and angle of the cot/incubator.
6	Ask a nurse to help in positioning the infant's head if needed and ask a parent or nurse to support the head, if needed.
7	Use warmed sterile Gel for the examination. Keep infant warm.

Ultrasound Imaging:	
	Standard views with curved array transducer via anterior fontanelle:
1	Coronal: <ol style="list-style-type: none"> <li>1. Frontal cortex.</li> <li>2. "Pentagon view" – MCAs in Sylvian fissures.</li> <li>3. Foramen of Monro/third ventricle.</li> <li>4. Fourth ventricular plane.</li> <li>5. Lateral ventricular trigones.</li> <li>6. Periventricular white matter and cortex.</li> </ol>
2	Sagittal: <ol style="list-style-type: none"> <li>1. Midline x 2 to show corpus callosum, 4<sup>th</sup> ventricle.</li> <li>2. Right lateral ventricle and caudo-thalamic groove.</li> <li>3. Right temporal and peri-trigonal white matter.</li> <li>4. Left lateral ventricle and caudo-thalamic groove.</li> <li>5. Left temporal and peri-trigonal white matter.</li> </ol>

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### Neonatal Cranial Ultrasound continued

3	<p><b>Linear Superficial:</b></p> <p>Used to assess extra-axial space, peripheral parenchyma of the brain, crossing vessels and superior sagittal sinus.</p> <p>Measure subarachnoid space at the level of the foramen of Monro in coronal plane. Document patent superior sagittal sinus with colour Doppler</p>
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	<b>Mastoid Fontanelle views:</b>
1	Coronal and axial images of cerebellar hemispheres and fourth ventricle. Scan from both sides when abnormality suspected.

#### Note:

1	The two hemispheres should be symmetrically displayed on coronal scanning via anterior fontanelle.
2	Depth of field and zoom should be set so that images are as large as possible. Avoid changing depth during the scan unless interrogating a region of suspected abnormality.
3	Use a light pressure scanning technique.
4	Automated image correction such as 'iScan' can give more reliable overall grey-scale gain in the variable lighting conditions of NICU, thereby avoiding overly bright images.
5	Obtain additional views, with curved array or linear transducer, of any area of abnormality in detail. Use two identical views, with and without measurements, if measurements are needed.

#### Additional imaging:

1	Posterior fontanelle, sub-occipital, transtemporal if clinically indicated or if standard views indeterminate.
2	Resistance Index (RI) of the ACA and Basilar arteries should be done when there has been hypoxic ischaemic insult in late third trimester (above 34 weeks) or the full term infants. Normal Range 0.65 – 0.85.