

NEONATAL SPINE ULTRASOUND

Neonatal Spine Ultrasound

Objective	To ensure that all staff follow correct procedure for ultrasound evaluation of the neonatal spine.
Responsibility	All sonographers, trainee sonographers, registrars and radiologists performing paediatric ultrasound examinations.
Frequency	For all neonatal spinal 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 spine.

Question to be answered:	
1	Are the vertebrae normal?
2	Is the cord central within the canal?
3	Is the central echo complex normal?
4	Does the cord end at or above L2-3 vertebral interspace?
5	Is the filum a thin thread?
6	Do the nerve roots move freely with CSF pulsation?
7	Is the CSF clear?
8	Does the thecal sac end at S2?

Step	Action
1	Review prenatal scans/reports if abnormal. Review radiographs of the spine if available, to count the number of lumbar and sacral segments and to look for anomalies.
2	The neonate should be scanned in a warm environment with the spine exposed but with the rest of the body covered.
3	The neonate is placed in prone position over a rolled towel or pillow with legs flexed. This allows flexion of the spine thereby separating the spinous processes and widening the acoustic windows. The head should be elevated relative to distal spine in order to distend the distal thecal sac with CSF.
4	Scan in sagittal plane and count vertebral bodies from coccyx superiorly – the coccyx is usually seen as a lucent mass of cartilage or a round ossification centre. The lumbo-sacral junction has a characteristic focal curvature. Image in sagittal section with numbered labelling of: <ol style="list-style-type: none"> 1. Distal sacrum and coccyx 2. Lumbo-sacral junction 3. Level of the conus tip.

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5	Conus medullaris should be characterised and its level of termination documented.
6	Identify filum if possible and measure thickness – it should not be more than 2mm.
7	Scan up to the cervico-thoracic spine if possible and document cervico-thoracic junction.
8	Use transverse scans to document position of cord in canal, to further identify intracanalicular mass, abnormal filum, diastematomyelia, hydromyelia or syrinx.
9	Assess CSF to ensure completely echofree; blood or debris in canal (e.g. following lumbar puncture) causes diffuse echogenicity of intrathecal spaces and poor delineation of cauda equina.
10	If level of termination of conus medullaris is in doubt try counting from the 12 th rib inferiorly or use a ball bearing (BB) taped on skin at the level of the conus tip, imaged with AP and lateral whole spine radiographs.
11	If a sacral or coccygeal dimple is present then image the position of the dimple in sagittal and axial planes.
12	Two images of each kidney can be obtained (sagittal and axial). If any abnormality is shown then perform a full renal evaluation.

Note:

1	Adequate imaging is possible only until approximately 4-6 weeks. Older infants have ossification of posterior spinous processes that prevent good penetration of the ultrasound beam.
2	If spinal scans are abnormal, consider cranial ultrasonography to follow.