PEDIATRIC SPINE ULTRASOUND EXAMINATION

POLICY: Pediatric spine ultrasound will be performed with an order from a physician or other qualified clinical practitioner. The examination will be supervised and/or performed and interpreted by a radiologist or other licensed practitioner who is qualified by reason of training to understand the normal anatomy, pathophysiology of the pediatric spine, and integration of ultrasound with other imaging techniques to optimize the probability of detecting disease.

PURPOSE: To assess the anatomy of the pediatric spine and document normal and abnormal structures therein.

INDICATIONS: Ultrasound of the pediatric spine is indicated for patients with lumbosacral signs associated with spinal dysraphism. Such signs include, but are not limited to midline or paramedian masses, skin discolorations, skin tags, hair tufts, hemangiomas, midline or paramedian dimples. Other indications for pediatric spine ultrasound include, but are not limited to: suspected defects such as cord tethering, diastematomyelia and hydrocephaly; caudal regression syndrome; detection of sequelae of injury (e.g.: hematoma after spinal tap or birth injury); evaluation for blood products within the spinal canal after intracranial hemorrhage; guidance for lumbar puncture; postoperative assessment for cord re-tethering. Contraindications include patients with open spinal dysraphism and patients with closed neural tube defects if the skin overlying the defect is thin or no longer intact.

PATIENT PREPARATION: There is no special preparation for this examination. However, the accuracy of pediatric spine ultrasound decreases as ossification of the spinous processes occurs. Patients should be less than six months of age for this examination in order to minimize these limitations. Pediatric spine ultrasound should only be scheduled at a facility where a qualified radiologist is on-site to participate or assist in the examination. Infants who have been recently fed are more likely to lie quietly during the examination. Use of warm blankets, warm ultrasound gel and pacifiers are also recommended during the ultrasound examination. The use of warm, sterile gel is required when scanning neonates.

PROCEDURE: Pediatric spine ultrasound will be performed with the patient in a prone position (lateral decubitus position is acceptable when necessary). The infant should be positioned to allow adequate spacing of the spinous processes and visualization of the spinal contents; flexed knees and/or a small bolster (e.g.: rolled blanket or pillow) may be used to help with positioning. The highest frequency linear transducer possible that will allow adequate penetration should be used in order to optimally visualize the spinal anatomy. The spine will be examined in sagittal and transverse planes. Transverse images will be oriented with the left side of the spine displayed on the left side of the screen.
The examination will generally be limited to the lumbosacral region; however, the entire spinal canal may be included in appropriate cases. Accurate identification of the vertebral level is crucial when performing pediatric spine ultrasound, particularly when demonstrating the termination of the conus medullaris. Vertebral level can be determined in a number of ways. The last rib-bearing vertebra can be presumed to be T12; image the last rib in a parasagittal plane, sweeping medial to identify T12. Count caudally to the termination of the conus. Another reliable method is to locate the lumbosacral junction and count cephalad from L5. The normal conus position, for a term infant, is above L3. The order of imaging for will be as follows (minimal number of images in parenthesis):

- Lumbar Spine (7 images, 3 cines)
- Sacrum/Coccyx (4 images, 2 cines)

Minimal stored images should include:

**Lumbar Spine:**
- one sagittal view of the medullary conus labeled *Long Spine*, with the vertebral bodies labeled
- one sagittal cine of the medullary conus, beginning laterally at the lowest left rib and sweeping to the through the entire spine; both T12 and the termination of the conus should be demonstrated; labeled *Long Spine Lt-Rt*
- two sagittal views of the cauda equina, to include demonstration of the filum terminale and lumbosacral junction (L5), labeled *Long Spine*
- one sagittal cine of the cauda equina, labeled *Long Spine Lt-Rt*
- one transverse view of the spine at the level of T12-L1 interspace, labeled *Trans Spine T12-L1*
- one transverse view of the spine at the level of L1-L2 interspace, labeled *Trans Spine L1-L2*
- one transverse view of the spine at the level of L2-L3 interspace, labeled *Trans Spine L2-L3*
- one transverse view of the cauda equina, labeled *Trans Spine CE*
- one transverse cine of the lumbar spine, from the conus medullaris through the cauda equina, labeled *Trans Spine Sup-Inf*

**Sacrum/Coccyx:**
- one sagittal view of the sacral spine labeled *Long Spine*
- one sagittal view of the coccyx labeled *Long Spine*
- one sagittal cine of the sacrum/coccyx, labeled *Long Spine Lt-Rt*
- one transverse view of the sacrum, labeled *Trans Spine S*
- one transverse view of the coccyx, labeled *Trans Spine Coccyx*
- one transverse cine of the sacrum/coccyx, from the distal cauda equina through the coccyx, labeled *Trans Spine Sup-Inf*