Germinal Matrix Hemorrhage

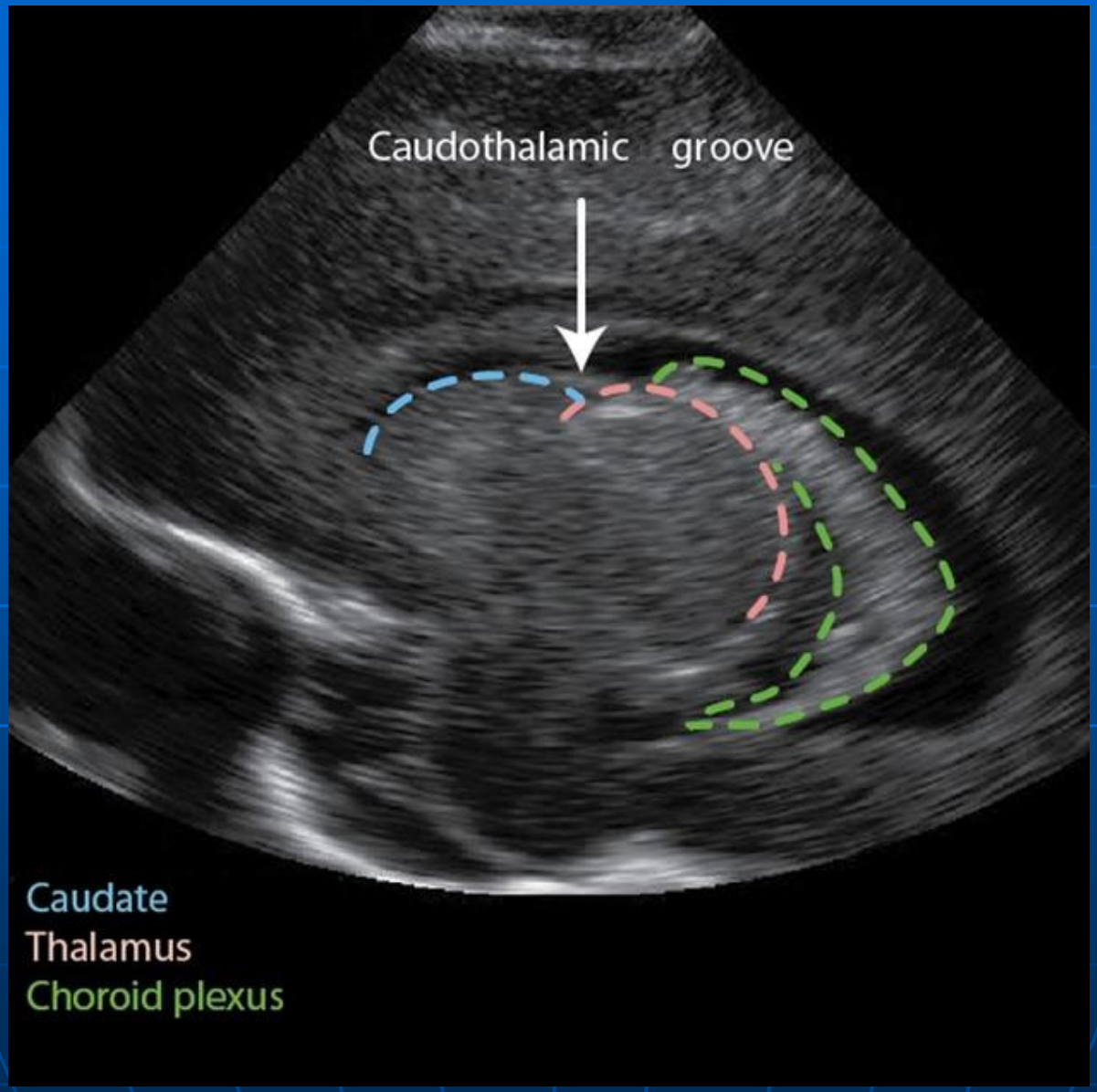
- Periventricular-intraventricular hemorrhages (PVIH)
- Most common type of intracranial hemorrhage in neonates
  - Related to a perinatal stress affecting the highly vascularised subependymal germinal matrix.
- Majority of cases occur in premature births within the first week of life.
- Is a cause of significant morbidity and mortality in this population.

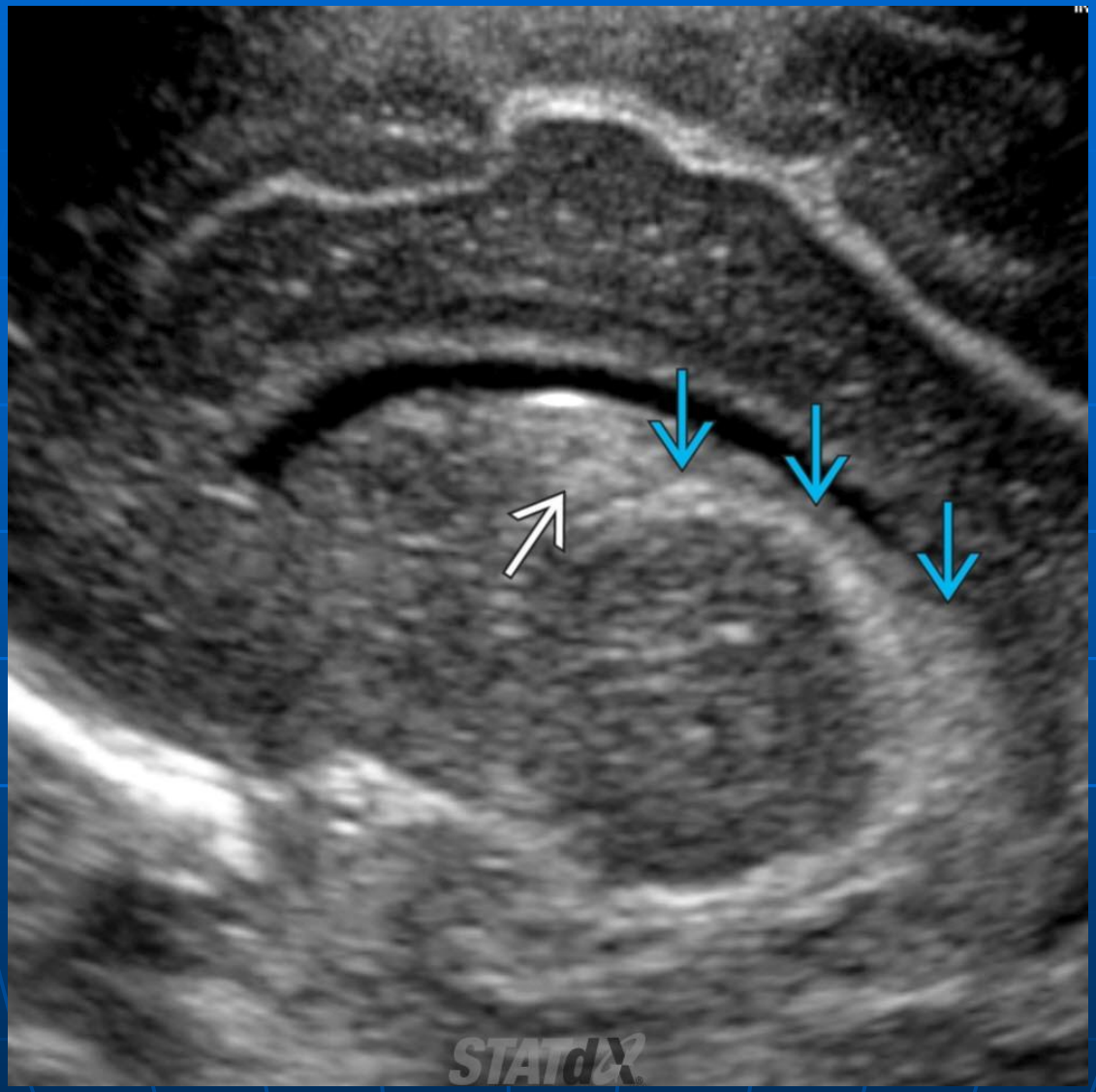
Germinal Matrix Hemorrhage

- Bleeding occurs initially in the periventricular areas.
- If this bleeding persists, the expanding volume of blood dissects into the adjacent lateral ventricles leading to an intraventricular hemorrhage.
- At 32 weeks germinal matrix is only present at the caudothalamic groove.
- By 35-36 weeks gestation the germinal matrix has essentially disappeared and thus the risk of haemorrhage is markedly reduced.

Germinal Matrix Hemorrhage

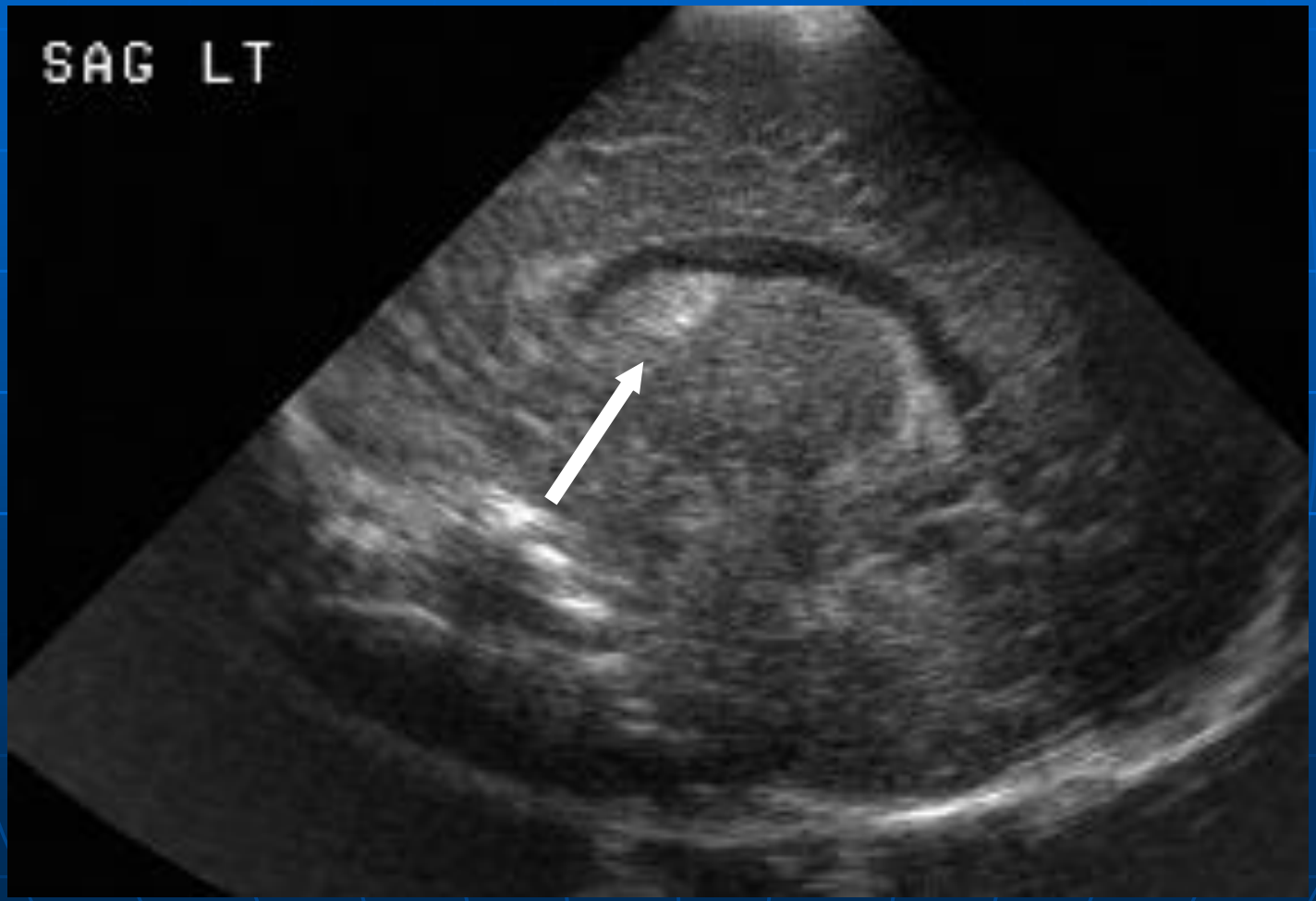
- **Grade I** - periventricular hemorrhage remains confined to one or both germinal matrices.
- **Grade II and III** - denote rupture into the ventricles.
- **Grade III** -Ventricular dilation is observed
- **Grade** - **IV** represents extension of the hemorrhage into the adjacent white matter
  - From venous infarct


Caudothalamic groove
Caudate
Thalamus
Choroid plexus

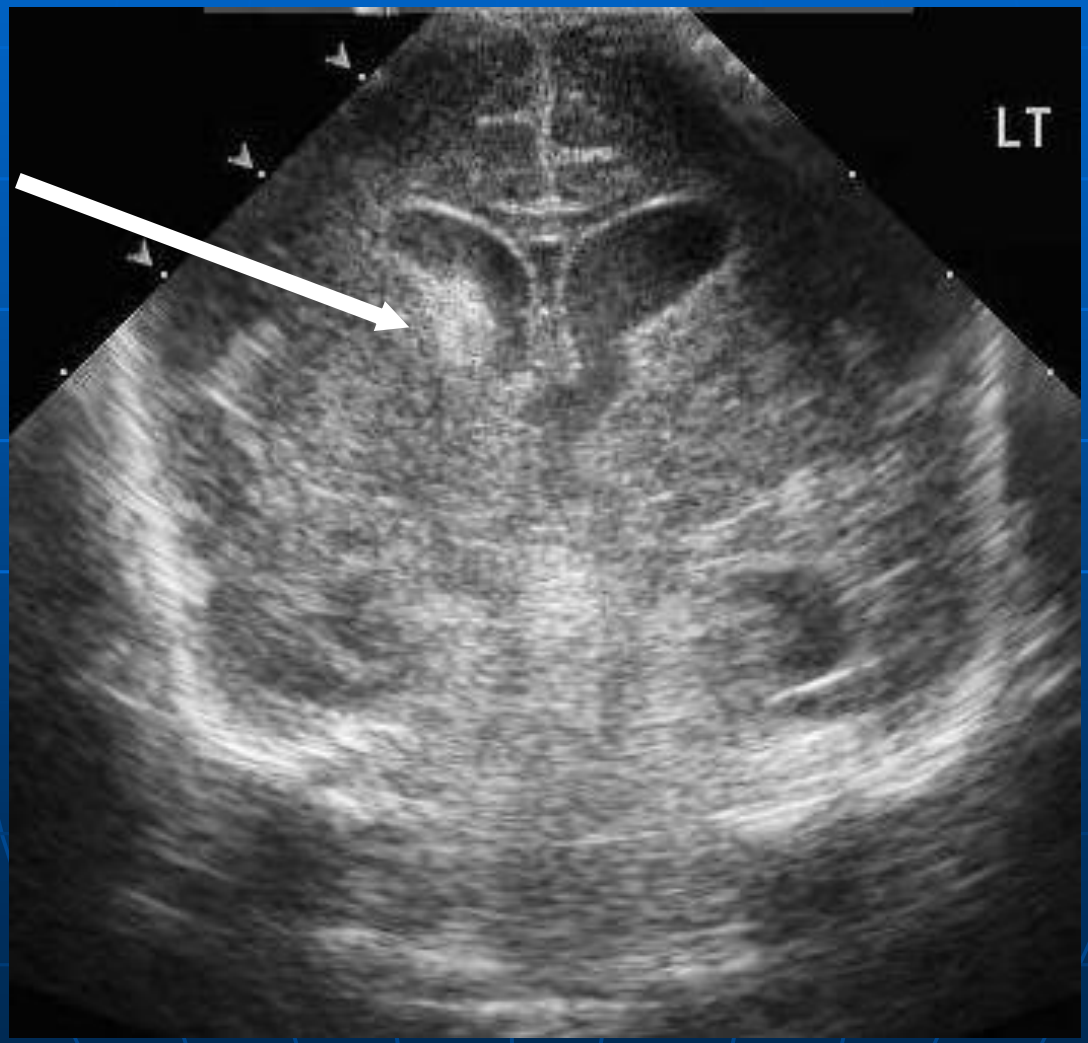


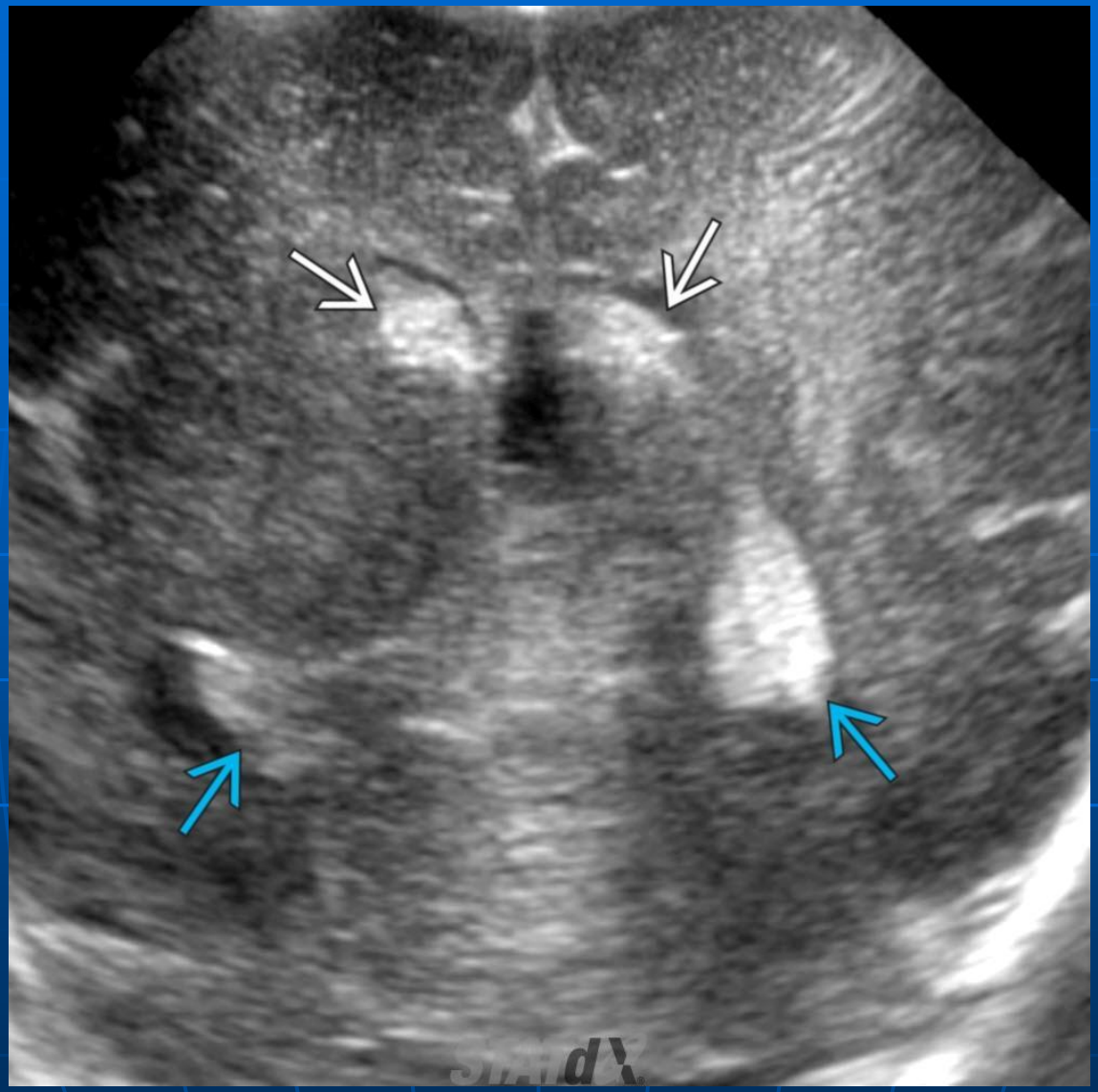
Sagittal head US in the same newborn shows increased echogenicity in the right caudothalamic groove (white solid arrow), consistent with a grade 1 hemorrhage. Note the anterior tapering of the normal echogenic choroid plexus (cyan solid arrow) up to the caudothalamic groove.

Grade I Subependymal Hemorrhage



Hemorrhage, germinal matrix 1





Coronal head US in a former 30-week premature infant < 24 hours after delivery shows bilateral GMH (white solid arrow) & IVH (cyan solid arrow) without ventriculomegaly, consistent with grade 2 IVH. Cine clips are the easiest way to distinguish GMH/IVH from normal choroid plexus (which is not easily done on this static image).

Grade 3