

# Monthly Clinical Pearl: What Do You Mean He Has an Intraventricular Hemorrhage??

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It was 1983, and it was my first time instilling surfactant, and everything had gone so well. This 24-week gestation male infant had weaned to room air and CPAP, and we were starting gastric tube feedings. My colleague, Elaine Farrell, brought the portable ultrasound machine around to screen each at-risk infant for evidence of periventricular/intraventricular hemorrhage (PVH/IVH) as per the recommendations of Luann Papille and co-authors (1). I still remember thinking “this baby cannot have, does not have, a PVH/IVH as he had not become acidotic or had a drop in his hematocrit! No problem, here Elaine....” Then Elaine put the probe on his anterior fontanelle and scanned him and said “Joe, he has a grade II IVH” .... Wow was I surprised and immediately felt defensive.

***“This was the beginning of our awareness of the fact that our very low birthweight infants, even if they received surfactant and did not develop respiratory distress syndrome (RDS) were still at risk for PVH/IVH (1).”***

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Since that time, the pathophysiology of PVH/IVH has been characterized and is felt to involve an element first of ischemia, then, increased passive perfusion because of impaired cerebrovascular autoregulation in the preterm infant (2). The focus of these hemorrhagic lesions is in the periventricular germinal matrix with its fragile vascular network (2). The grading system proposed by Papille et al. has stood the test of time and is still used clinically in many hospitals. The only difference in the sequence of pathophysiology is in the grade IV PVH, which is now felt to be a venous hemorrhagic infarction in the drainage area of the periventricular terminal vein (2,3).

The questions we had then and clinicians and families ask now is “Is there anything we can do treat this and what does this mean for this infant’s long-term outcome?”. Once the hemorrhage has occurred, close monitoring of the infant’s neurological status,

growth, and head circumference are really important, especially if the hemorrhage is Grade III or IV. Also, screening head ultrasounds are an important way to monitor resolution or for the development of post-hemorrhagic hydrocephalus (PHH) (2,3). Management of Grade III IVH has included serial lumbar punctures and the placement of a ventricular reservoir; however, a recent Cochrane collaboration evaluation by Whitelaw and Lee-Keeland failed to demonstrate any improvement in long-term neuro-developmental outcomes over conservative management (4).

The additional question to ask is “Is there anything we can do to prevent this in our babies in the future?” For the future, Prevention can continue to be achieved with antenatal corticosteroids and some studies have shown prevention with postnatal indomethacin prophylaxis (2). In addition to pharmacological strategies, researchers are spending time focusing on genetic and environmental approaches.

#### References:

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