**Arterio-venous malformation (AVM)**

**AVM**
Arterio-venous malformation is a tangled bundle of abnormal arteries and veins that are directly connected to each other. Normally an artery gives rise to tiny capillaries which are interposed within the tissue of the brain. The capillaries then give rise to a vein which drains blood back to the larger venous system on its way back to the heart. With AVMs, however, blood is shunted from an artery directly into a vein without having nourished brain tissue. In fact, brain tissue is entirely displaced to the outskirts of the malformed tangle of vessels of an AVM. An AVM may be located on the surface of the brain or deep within the brain. An AVM is supplied by one or more arteries usually referred to as feeders, and blood exits through one or more draining vein. Most AVMs were present at birth. Dural AVMs are a special type of malformation which can develop in childhood or adult life. AVMs are rare; bleeding from an AVM accounts for only 1% of all strokes.

**What can result from AVMs?**
Most AVMs are discovered as physicians start looking for reasons of some complications that took place in patients that have them, these complications could be:

1. **Bleeding**. Which is the most feared complication of an AVM. This usually occurs in patients between ages 30 to 50. If an AVM is deep in the brain, blood is released into the brain tissue; this occurs about 2 out of 3 of the time and is called ICH. If an AVM is on the brain surface bleeding is released into the CSF, which is called subarachnoid hemorrhage (SAH).
2. **Seizures.** AVMs are diagnosed when the patient develops seizures. Patients presenting with seizures as an initial symptom are usually younger than those presenting with hemorrhage. Because of where the malformations are usually located, patients may report non convulsive seizures (episodes of odd sensations or visual hallucinations).
3. **Headaches**. In some patients the first symptom occurs as a headache. Like seizures, headaches usually first present in patients during adolescence. Typically patients have throbbing headaches which always occur in the same location.
4. **Focal neurologic deficits**. AVMs may occasionally manifest as weakness on one side of the body, sensory loss, or a speech or visual disturbance. This can result from either local brain compression, or less commonly from ischemia in adjacent brain regions if the AVM "steals" blood flow intended for that area.

**How is an AVM treated in the NNICU?**
The primary role of the neuro-ICU in AVM patients is for treating the complications of hemorrhage. This may include reduction of blood pressure (preventing re- bleeding and swelling of the brain), preventing seizures, and treatment of brain swelling (cerebral edema) and increased intracranial pressure. Once a ruptured AVM is stabilized, it can be treated by surgery.