

Arteriovenous Malformation

Background

Arteriovenous malformation (AVM) is a rare condition in which blood vessels are abnormally tangled, creating direct connections between arteries and veins. An AVM disrupts the normal flow and exchange of oxygen-rich and deoxygenated blood to the tissue. These tangled blood vessels do not form properly, causing them to weaken and potentially rupture. Treatment of an AVM depends on its location and size, and how it affects the child. Sometimes an AVM doesn't cause symptoms and may never be detected.

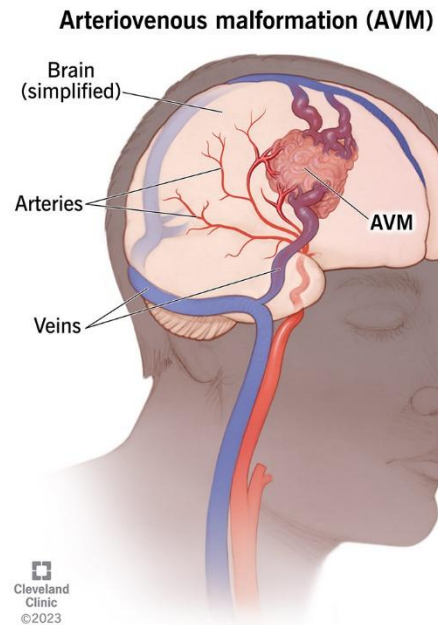
An AVM can develop anywhere in the body, though they are most commonly found in the brain and spinal cord. Symptoms may include:

- Headache
- Nausea, vomiting
- Numbness, tingling
- Muscle weakness
- Changes in movement, balance, vision
- Trouble walking
- Problems with memory, thinking
- Seizures

An AVM rupture in the brain can lead to a life-threatening hemorrhagic stroke, also known as a “brain bleed.” In about half of all brain AVMs, this life-threatening emergency is the first sign of its presence. Each time blood leaks into the brain, normal brain tissue is damaged. This results in loss of normal function, which may be temporary or permanent. Increased fluid and pressure within the brain must be drained. A shunt is surgically implanted as a long-term treatment to manage the excess fluid. A ventriculoperitoneal (VP) shunt requires a healthcare plan and education regarding emergency action.

Like any other medically implanted device, complications can arise from various factors including obstruction (blockage), infection, displacement, or mechanical failures.

Shunts can also face the risk of unintended setting changes due to the strength, proximity and hidden nature of everyday magnets. Manufacturers guidelines should be followed for safety restrictions or precautions specific to the type/brand of shunt.



Top Takeaways for School

An AVM is an abnormal tangle of arteries and veins that disrupts normal blood flow and increases the risk of bleeding and tissue damage. An AVM in the brain can lead to a hemorrhagic stroke.

Students who have experienced an AVM may require extensive acute care and outpatient rehabilitation depending on the location of brain damage.

A student may require new or different related services, specialized instruction, or reasonable modifications based on current symptoms. Revisiting the IEP or 504 may be necessary.

School reintegration plans must consider changes in the student's physical/motor ability, muscle weakness, and balance. A school walk-through is encouraged to evaluate safety concerns, fall risk, and energy demands for student success.

Considerations for the Individualized Healthcare Plan (IHP)

- Nursing diagnoses: Risk for increased intracranial pressure, impaired physical mobility, impaired verbal communication, impaired thought process, risk for injury
- Assessment of implanted medical device (consider location, date of surgical placement, and device-specific information)
- Use of specialized equipment, adaptive equipment, and orthotics
- Activity, positioning, transferring (consider precautions and/or restrictions)
- Equipment troubleshooting (consider equipment/device user manual, battery, charger)
- Consider emergency action plans (EAPs) and emergency evacuation plans (EEPs) related to special health care needs, including staff education/training

Discussion Starters for the Educational Team

1. Would the student benefit from evaluations or assessments in any of the following areas: physical therapy, occupational therapy, speech and language therapy, assistive technology, adapted physical education, functional behavior, psychology, hearing and vision?
2. Would the student benefit from additional academic support and/or modified education (e.g., copies of notes, extra time, reduced workload, simplified instructions, alternative formats for presentation of material, 504/IEP)?
3. Would schedule flexibility support the student?
4. Is the physical school environment safely accessible for the student's mobility needs (e.g., entry and exit, ramps, location of classes, access to elevator, doorways)?
5. Does the student require activity precautions to prevent injury?
6. Can rest breaks, safe spaces or reduced stimulation times be built into the student's schedule?
7. Will staff receive education/training to implement the student-specific emergency plan?

Resources

Kennedy Krieger Institute: Center for Brain Injury Recovery
kennedykrieger.org/patient-care/centers-and-programs/center-for-brain-injury-recovery

Boston Children's Hospital: AVM
childrenshospital.org/conditions-treatments/arteriovenous-malformations



For more information, please scan the QR code or visit: KennedyKrieger.org/SHNIC

