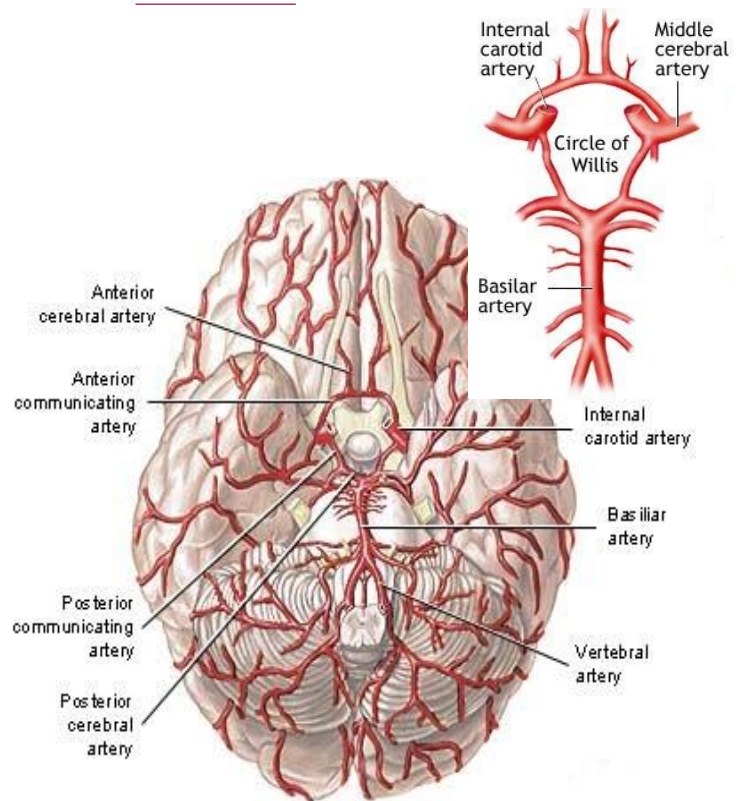


Cerebral Aneurysm

The blood supply for the brain is distributed via the arteries, plus thousands more veins and capillaries. The brain actually receives one fifth of the cardiac output with each heartbeat.

The blood supply is carried by the two internal carotid arteries (ICA) and the two vertebral arteries that anastomose (converge) at the base of the brain to form the Circle of Willis.

The picture on the right shows the main arteries in the brain.



What is an aneurysm?

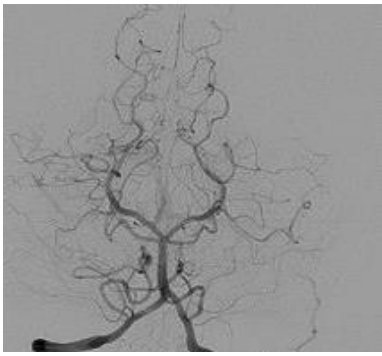
The word aneurysm comes from the Greek word *aneurysma* which means widening. An aneurysm is, basically, a bulge in an artery. Aneurysms can be congenital, meaning that they are present at birth, or they can occur due to a weakening in the arteries caused by high blood pressure, head trauma or atherosclerosis (blocked arteries). There are three types of cerebral aneurysms.

Saccular aneurysm	A saccular aneurysm is a rounded sac containing blood, that is attached to a main artery or one of its branches. Also known as a berry aneurysm (because it resembles a berry hanging from a vine), this is the most common form of cerebral aneurysm accounting for 90% of cases. It is typically found on arteries at the base of the brain. Saccular aneurysms occur most often in adults.
Fusiform aneurysm	A fusiform aneurysm balloons or bulges out on all sides of the artery.
Mycotic aneurysm	A mycotic aneurysm occurs as the result of an infection that can sometimes affect the arteries in the brain. The infection weakens the artery wall, causing a bulging aneurysm to form.

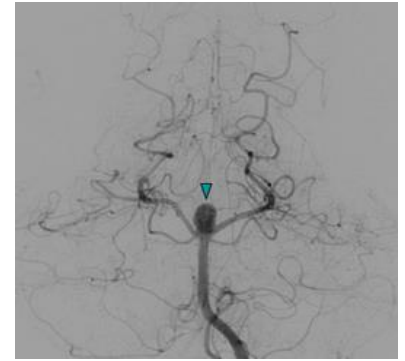
Aneurysms are also classified by size: small, large, and giant.

Small aneurysm	Less than 11 millimetres in diameter
Large aneurysm	11 to 25 millimetres in diameter
Giant aneurysm	Greater than 25 millimetres in diameter

About 5% of the population has some type of aneurysm in their brain. Risk factors include a family history of cerebral aneurysms, and certain medical problems such as polycystic kidney disease and coarctation of the aorta.



The diagram on the left shows a normal cerebral angiogram of the posterior circulation of the brain. Compare this with the angiogram on the right showing a basilar artery apex, or basilar caput aneurysm, marked by the arrowhead. If you study the diagram of the blood supply and the Circle of Willis above you can better understand where this particular aneurysm is situated.



Approximately 85% of aneurysms develop in the region of the Circle of Willis, usually the anterior part.

Classification of Severity

In outlining symptoms of a ruptured cerebral aneurysm, it is useful to make use of the Hunt and Hess scale of subarachnoid haemorrhage severity.

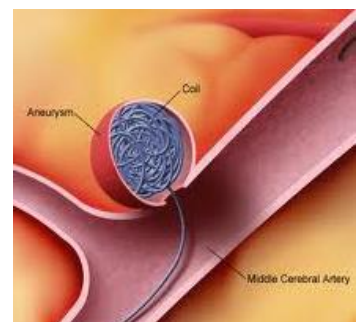
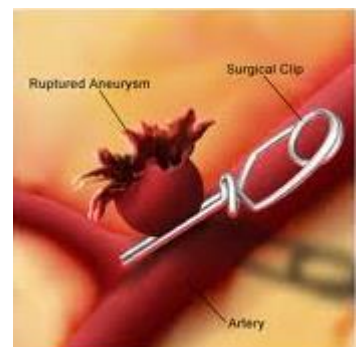
Grade	Description	Survival Rate (approx.)
1	Asymptomatic or minimal headache, slight neck stiffness	70%
2	Moderate to severe headache, neck stiffness, no neurological deficit except some palsy (paralysis) of the cranial nerves	60%
3	Drowsy, some neurological deficit	50%
4	Stuporous, partial body paralysis or involuntary jerking of limbs	20%
5	Deep coma, showing signs of severe neurological impairment, approaching death	10%
6	Brain dead	0%

Treatment and Prognosis

A cerebral aneurysm is a potential medical emergency and prognosis obviously vastly depends on if the aneurysm has ruptured or not. Most aneurysms only cause noticeable symptoms if they burst.

Emergency treatment for individuals with a ruptured cerebral aneurysm generally includes restoring deteriorating respiration and reducing intracranial pressure. Currently there are three treatment options for brain aneurysms: medical hypotensive therapy (reduction of blood pressure), surgical clipping (clipping off the blood supply to the aneurysm) or endovascular coiling (inserting coils onto the aneurysm to induce clotting). If possible, either surgical clipping or endovascular coiling is usually performed within the first 24 hours after bleeding to occlude the ruptured aneurysm and reduce the risk of it bleeding again.

The outcome varies. Patients who are in deep comas after an aneurysm rupture generally do not do as well as those with less severe symptoms. Ruptured cerebral aneurysms are often fatal. About 25% of people die within one day, and another 25% die within about three months. Of those who survive, more than half will be permanently disabled.



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References

<https://www.ninds.nih.gov/Disorders/Patient-Caregiver-Education/Fact-Sheets/Cerebral-Aneurysms-Fact-Sheet>
https://www.emedicinehealth.com/aneurysm_brain/article_em.htm#what_is_the_treatment_for_a_brain_aneurysm
<http://www.columbianeurology.org/neurology/staywell/document.php?id=35871>