

the posterior communicating artery and the posterior cerebral artery. In most humans, the posterior cerebral artery receives its blood supply from the vertebral/basilar system. In some people, the posterior communicating artery is quite large, and the posterior cerebral artery may be perfused significantly by the carotid artery.

Generally speaking, the anterior circulation supplies the forebrain (the cerebral hemispheres and the diencephalon), and the posterior circulation supplies the brainstem and the upper spinal cord. However, for most people, the arterial supply to the CNS is not quite that simple. As just mentioned, the posterior cerebral artery supplies the posterior forebrain, including some deep structures, and it also supplies parts of the midbrain in the brainstem. Thus, as indicated in the chart (by listing the posterior cerebral artery twice, once in each group), the posterior cerebral artery contributes to both the anterior and posterior circulations. As you study this tutorial, you should learn the distributions of these 8 arteries listed in this chart.

Supply	Cerebral artery	Group
Internal carotid	1. Anterior cerebral artery 2. Middle cerebral artery 3. Anterior choroidal artery 4. Posterior communicating artery 5. Posterior cerebral artery	Anterior circulation
Vertebral / Basilar	5. Posterior cerebral artery 6. Superior cerebellar artery 7. Anterior inferior cerebellar artery 8. Posterior inferior cerebellar artery	Posterior circulation

The anterior circulation

The four major arteries that arise from the **internal carotid artery** plus the posterior cerebral artery form the *anterior circulation*. The pattern of branching of each artery is similar: each gives rise to branches that supply cortical structures and each gives rise to branches that penetrate the ventral surface of the brain and supply deep structures (the basal ganglia, thalamus and internal capsule), as illustrated in the [Figures A17 & A18](#). (The branches that supply deep structures are known collectively as perforating arteries, central arteries, striate arteries, or ganglionic arteries.)

An extensive region of the central and lateral cerebral hemispheres is supplied by the **middle cerebral artery** (green shade in [Figure A18](#)). Included in this region are the sensorimotor areas that govern the upper extremities and face, and the language areas of the left hemisphere (Broca's area and Wernicke's area). The **anterior cerebral artery** supplies regions in the medial aspect and dorsal and orbital margins of the frontal lobe, and the medial aspect and dorsal margin of the anterior parietal lobe (yellow shade in [Figure A18](#)). Included in this extended territory are sensorimotor areas in the paracentral lobule that govern the lower extremity, accessory motor areas in the cingulate gyrus that govern the upper face (see [Box 17A](#) in *Neuroscience, 5th Ed.*), and limbic areas in the medial frontal lobe. The **posterior cerebral artery** supplies regions in the posterior parietal lobe, inferior temporal lobe and occipital lobe (blue shade in [Figure A18](#)). Included in this region are primary and associational (higher-order) visual areas in each lobe and 'limbic' regions in the posterior cingulate and parahippocampal gyri.