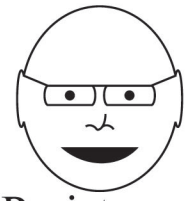
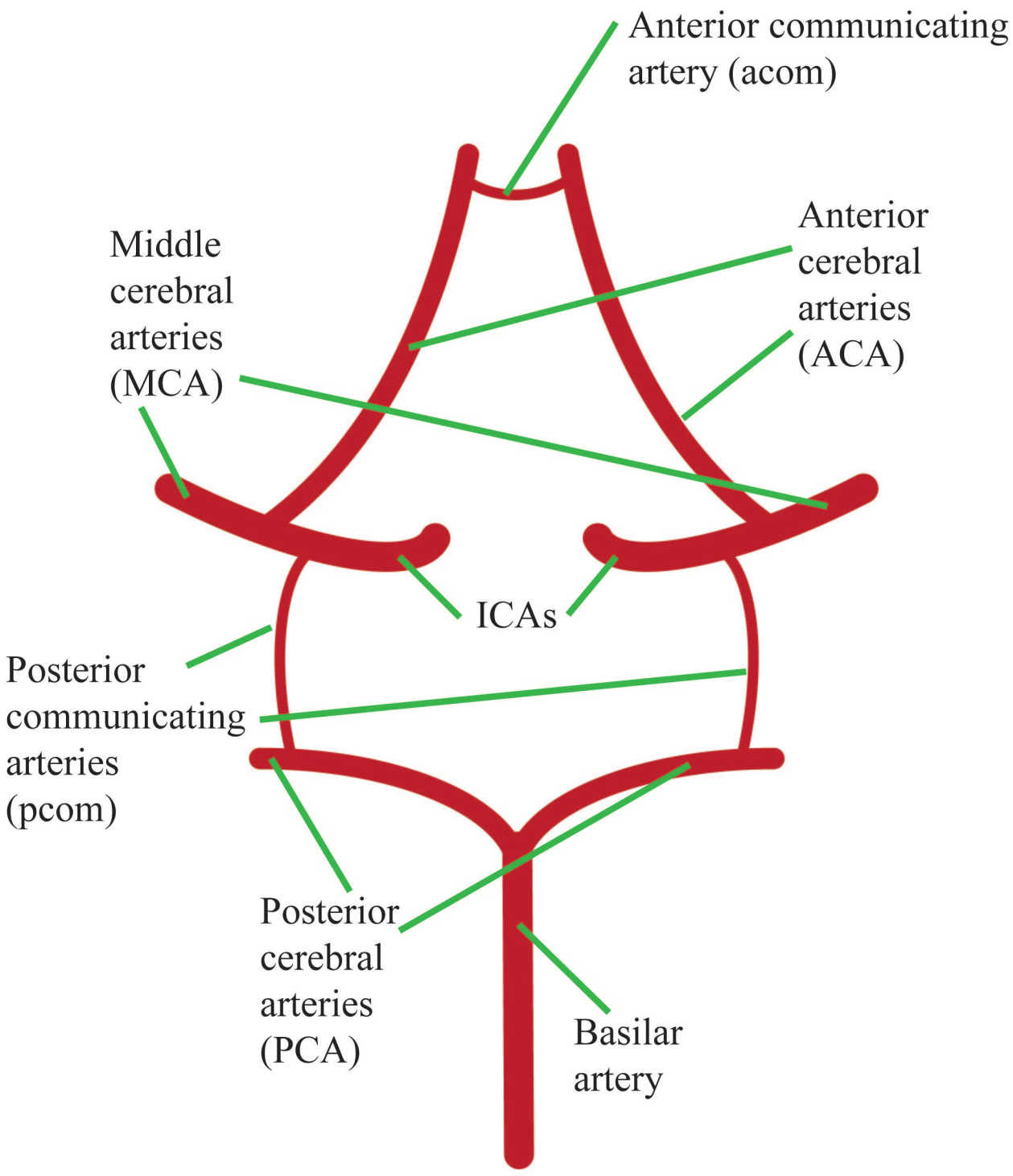


Peristence & Creativity

# Anatomy Comics, Objective 8.3

Simple Comix

8.3 Trace the flow of blood into the cranial cavity. Follow the flow of blood through the cerebral arterial circle. Indicate the region of cerebrum and cerebellum supplied by each major branch and known vascular interconnections.



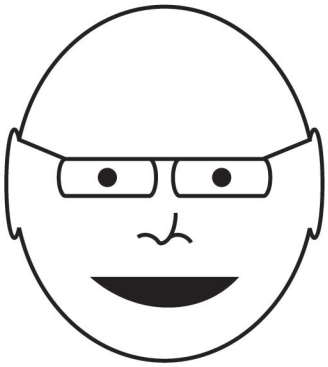
1. A 70 year old man with sudden onset right hemiparesis (stroke) undergoes a head CT scan (below). What arterial territory is involved?

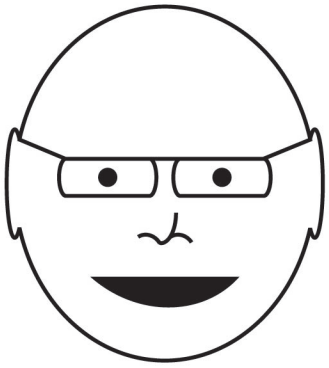
A. Anterior cerebral

B. Middle cerebral

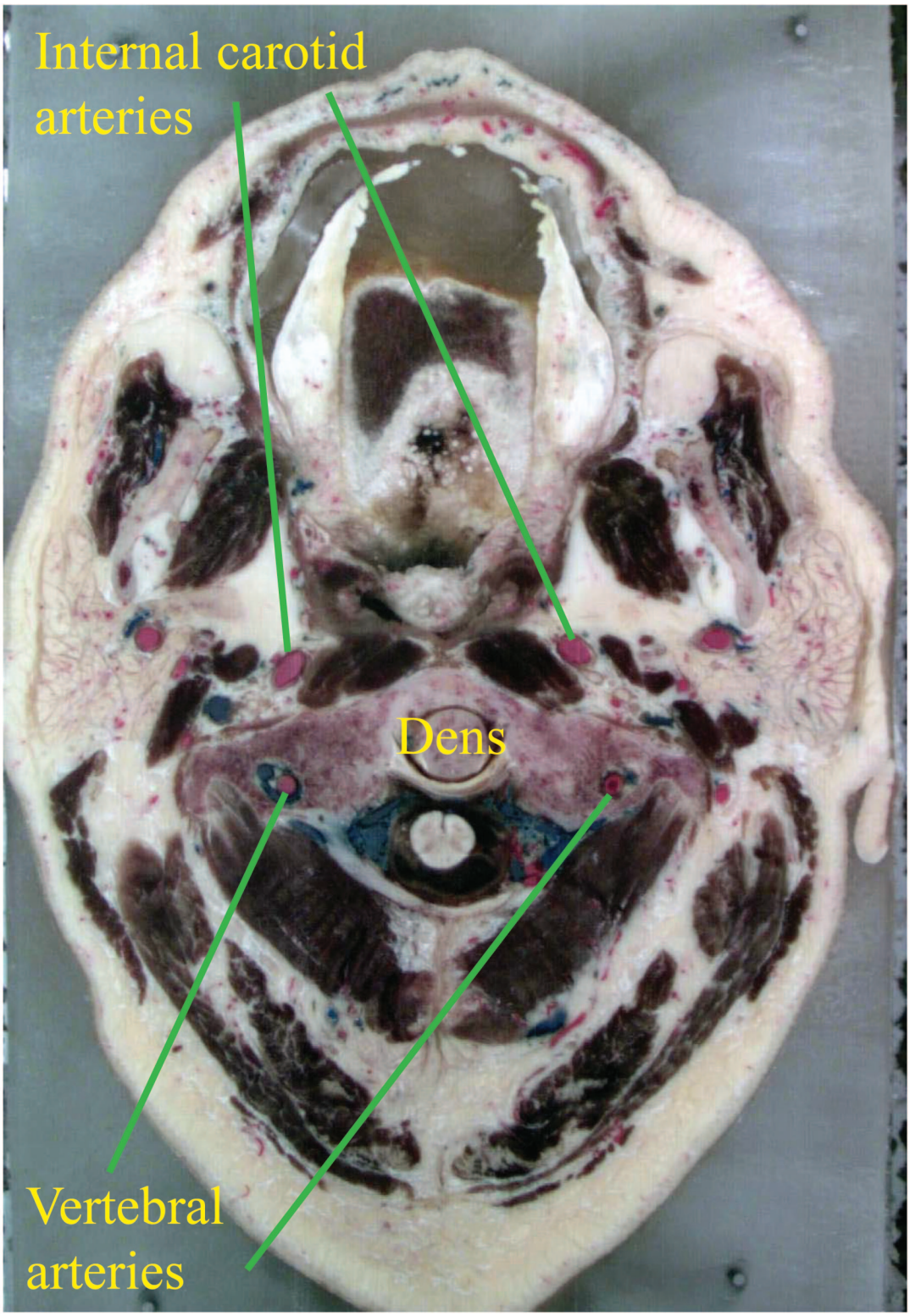
C. Posterior cerebral

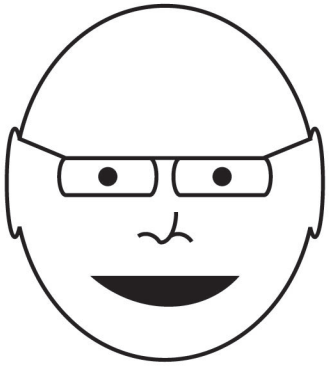
This is a classic middle cerebral artery (MCA) territory stroke. The ischemic brain becomes edematous, which causes it to be less dense (blacker) than normal brain. Compare the abnormal left brain (arrows) to the normal right brain.



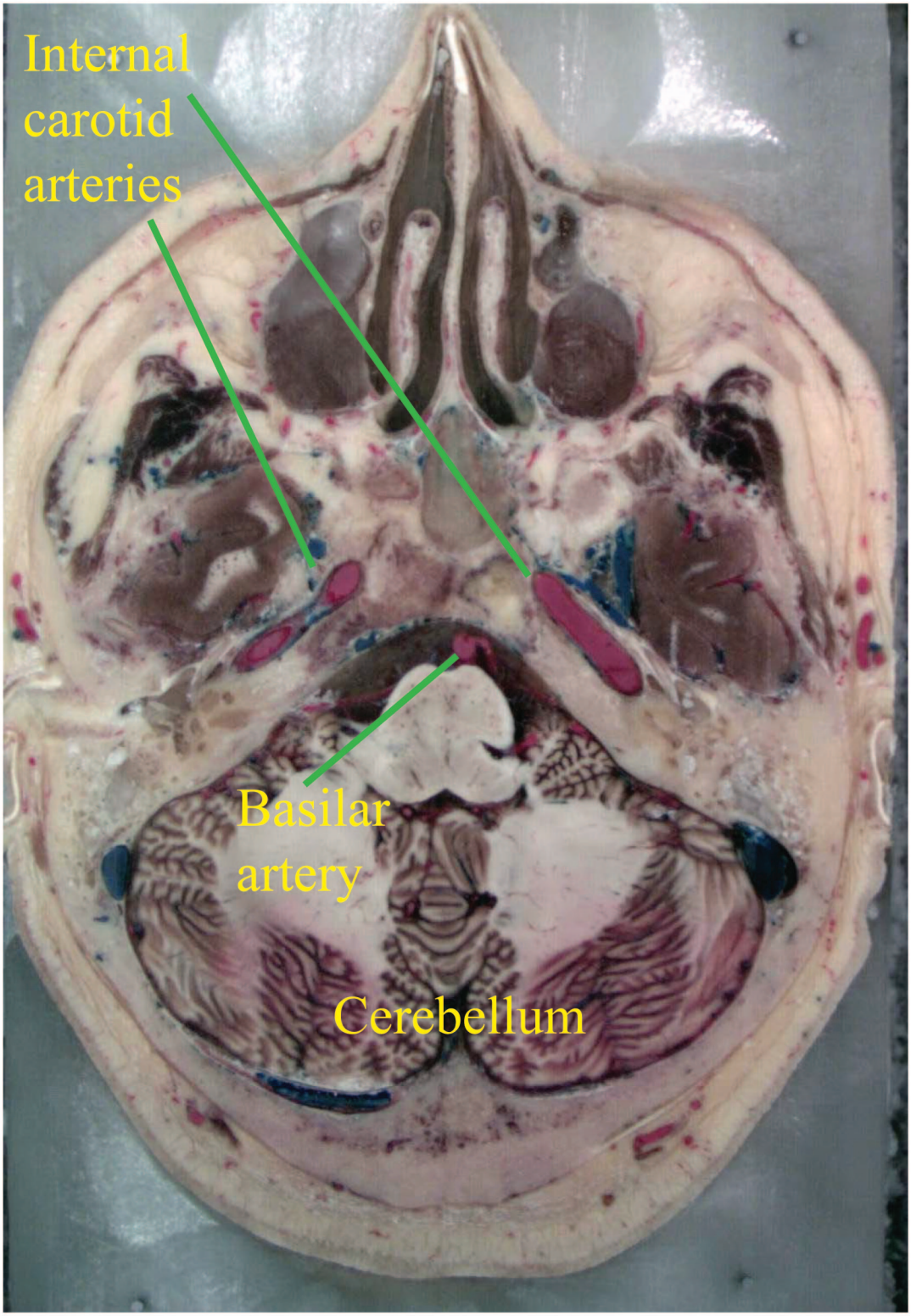


As usual, we will use a combination of simple line drawings (which we want you to draw or trace) and images from the visible human project to begin exploring the arteries that supply the brain. We'll start in the neck, just below the skull base.

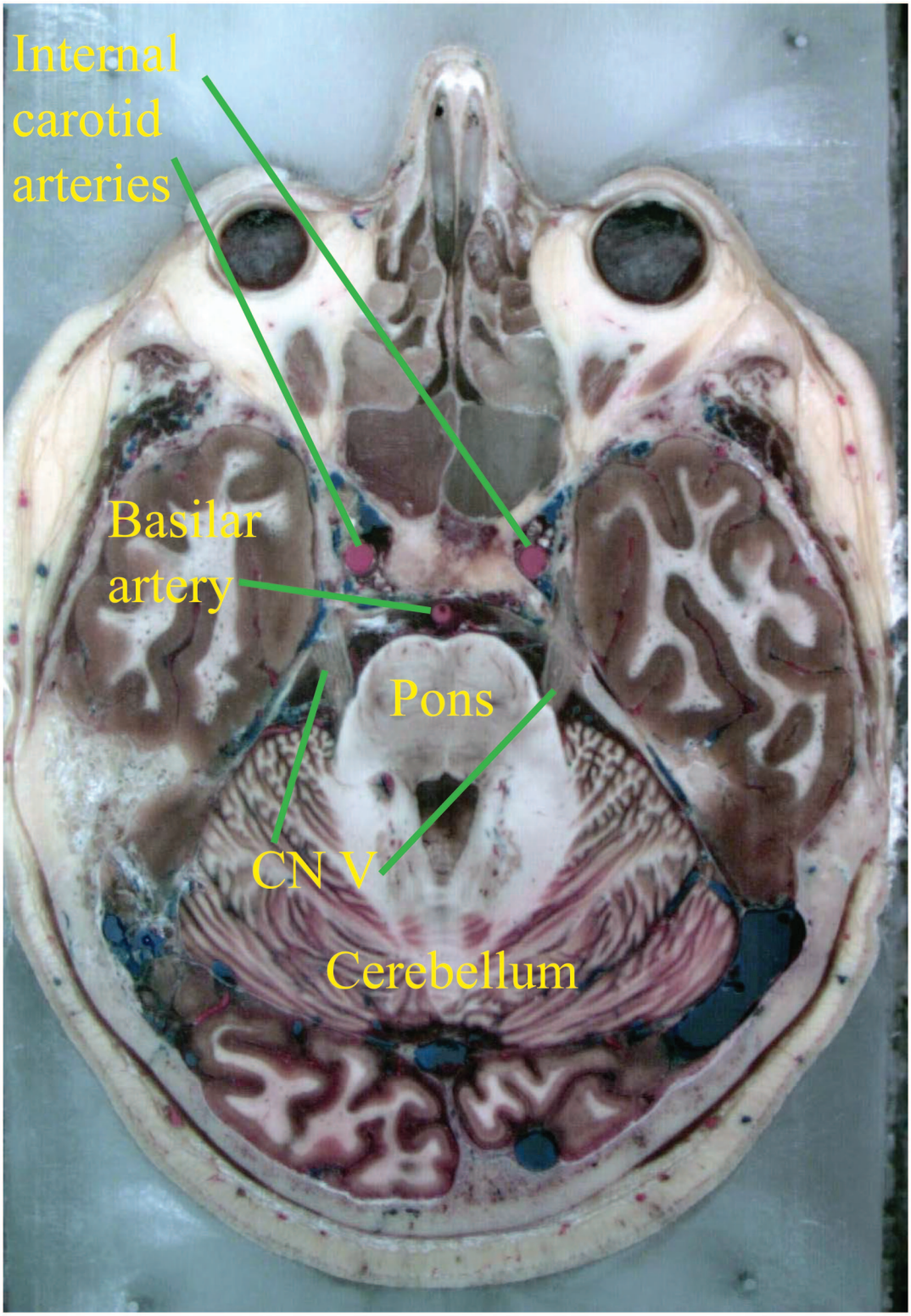




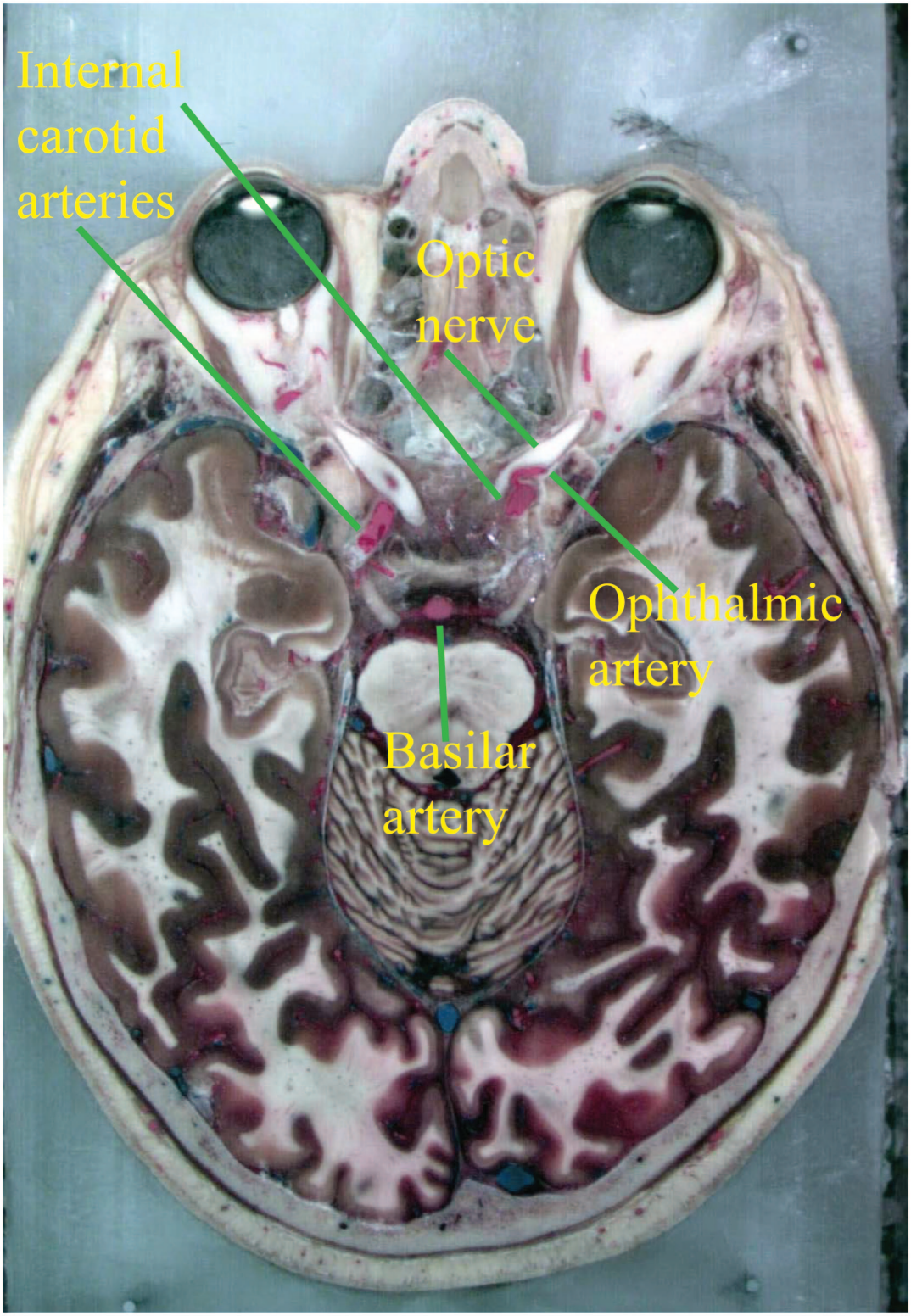
In the skull base, the internal carotids travel horizontally through the petrous portion of the temporal bone. Meanwhile, the vertebral arteries have fused to form the basilar artery.

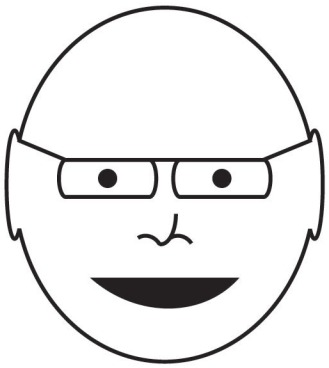


The internal carotids next travel through the cavernous sinuses. Check out those monster trigeminal nerves (CN V)!

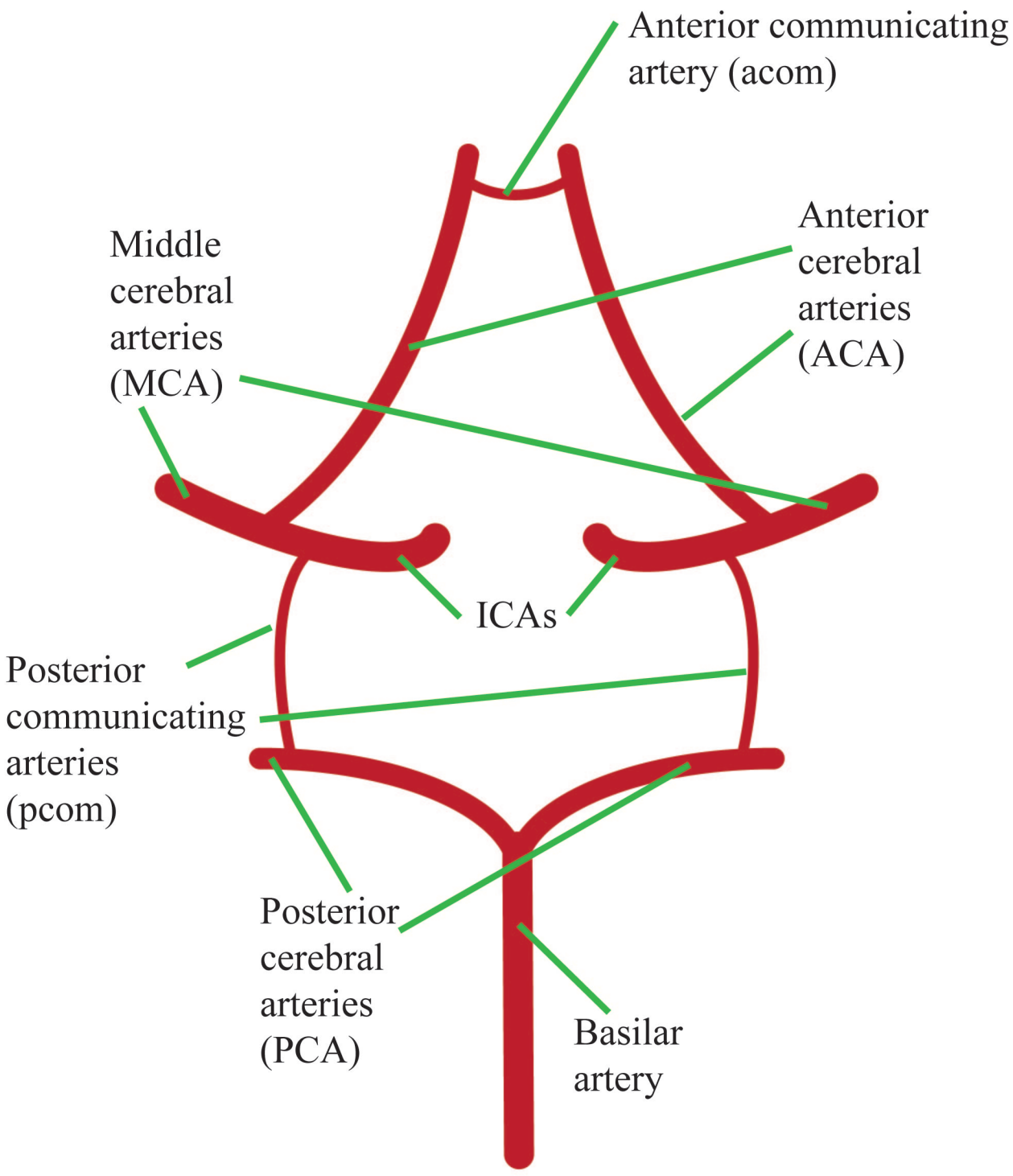


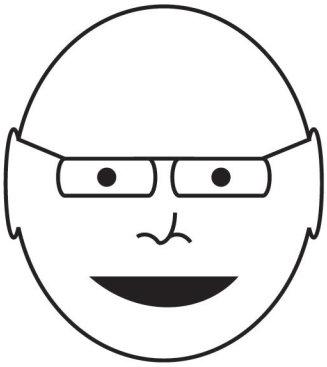
After the carotid emerges from the cavernous sinus, it gives off the ophthalmic artery. This portion of the carotid artery is known as the cerebral part. Now, as you can see the basilar is not slacking off, it is giving off a bunch of important vessels, but we'll let you study those on your own.



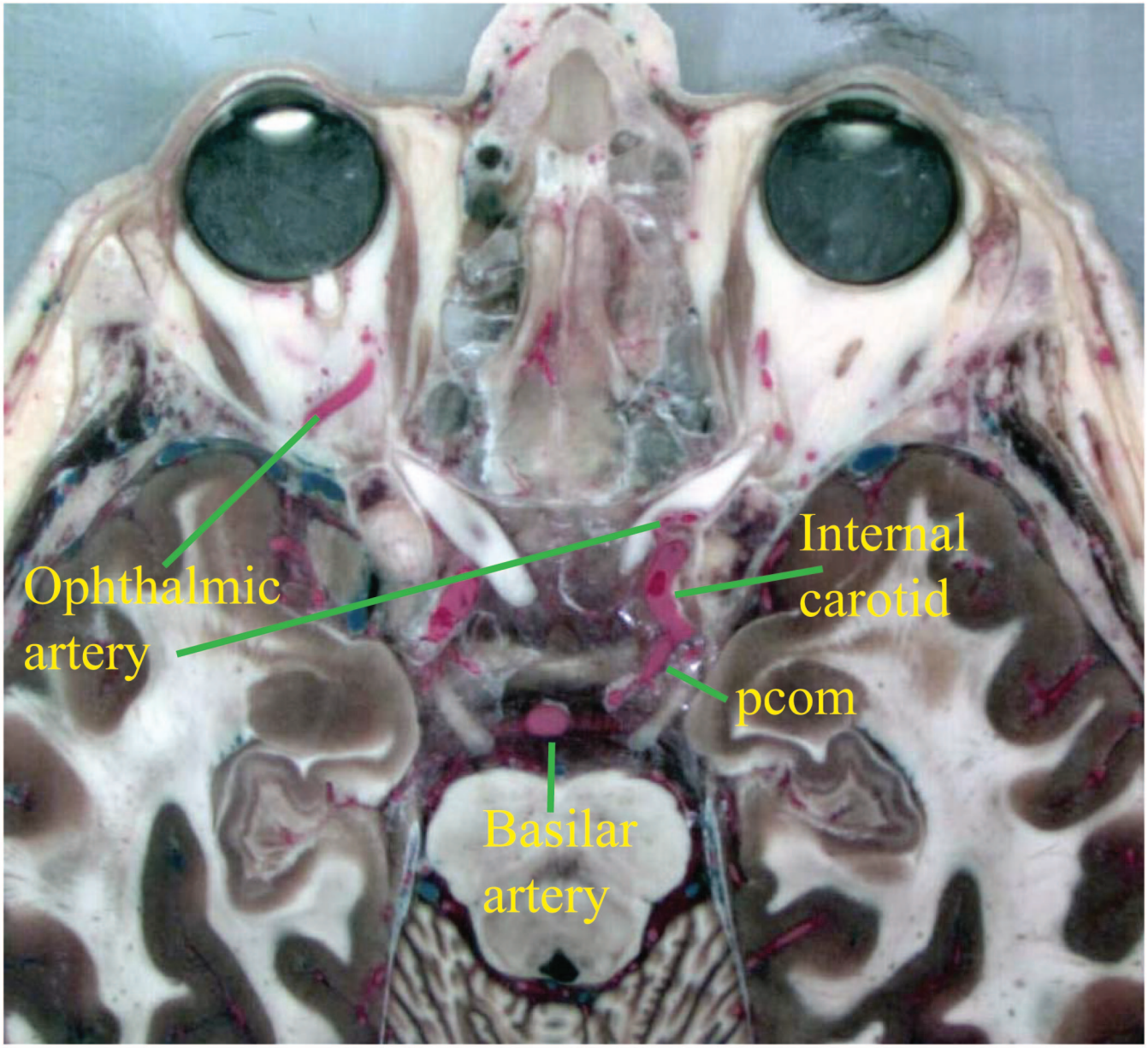


The basilar artery and the cerebral part of the internal carotid artery combine to form a structure called the circle of Willis (COW), which connects the internal carotids with the basilar artery and allows for collateral blood flow if one of the major intracranial vessels is occluded. Let's stop and draw the COW, looking at the anatomy as a drawing first will help us understand the visible human images better.

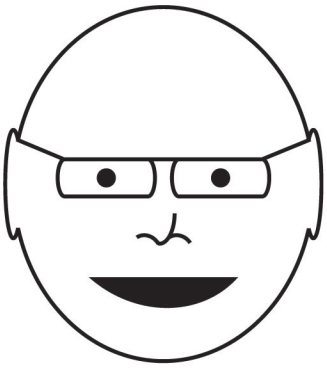




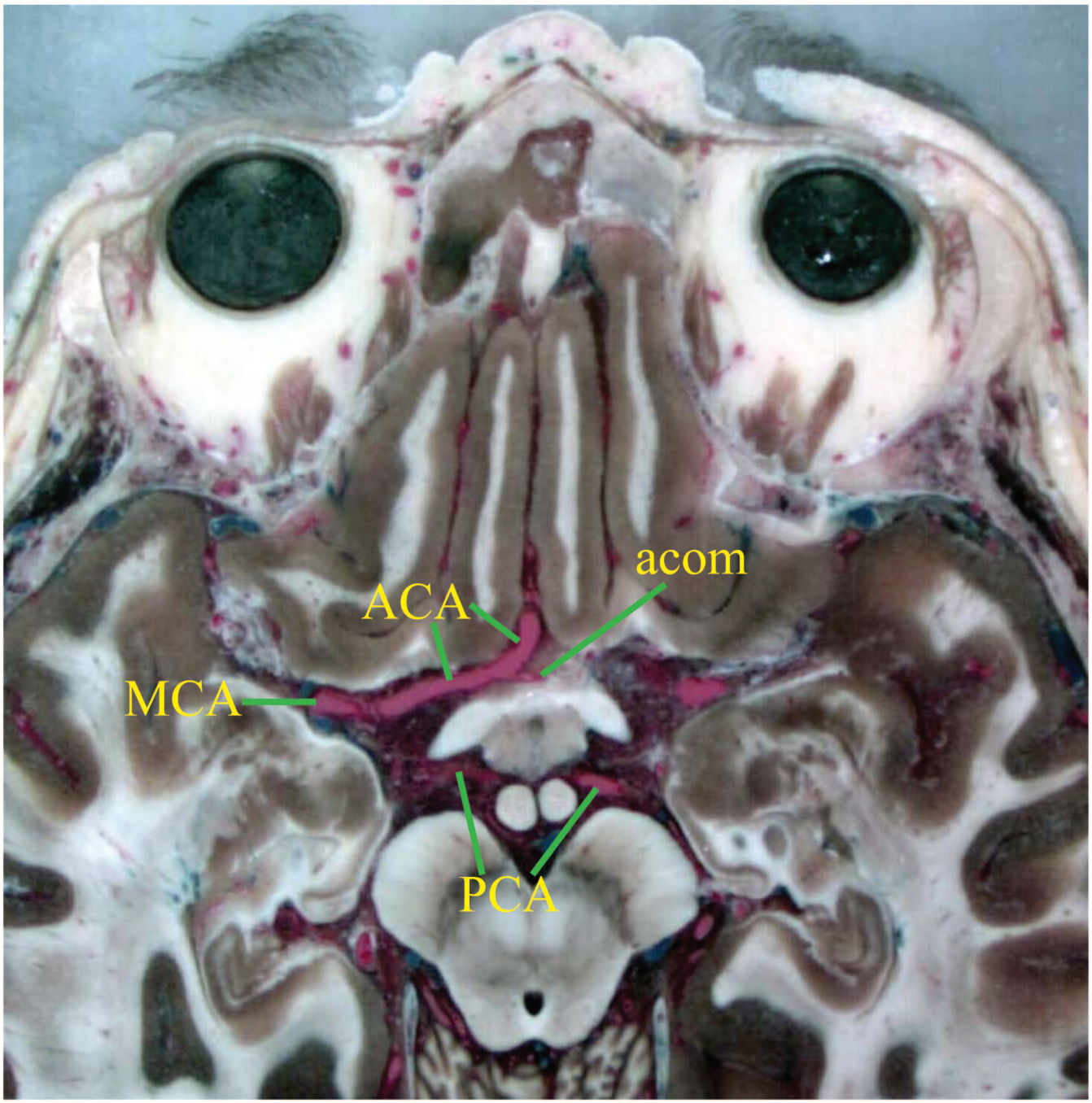
We'll continue our course to the top of the head, but we'll slow way down so that we can identify as many parts of the COW as possible. Keep in mind that real life is messier than our drawing, so we'll only be able to see fragments of the individual elements of the COW as we proceed. You'll have to mentally piece things together. To make things easier, we'll crop the images.



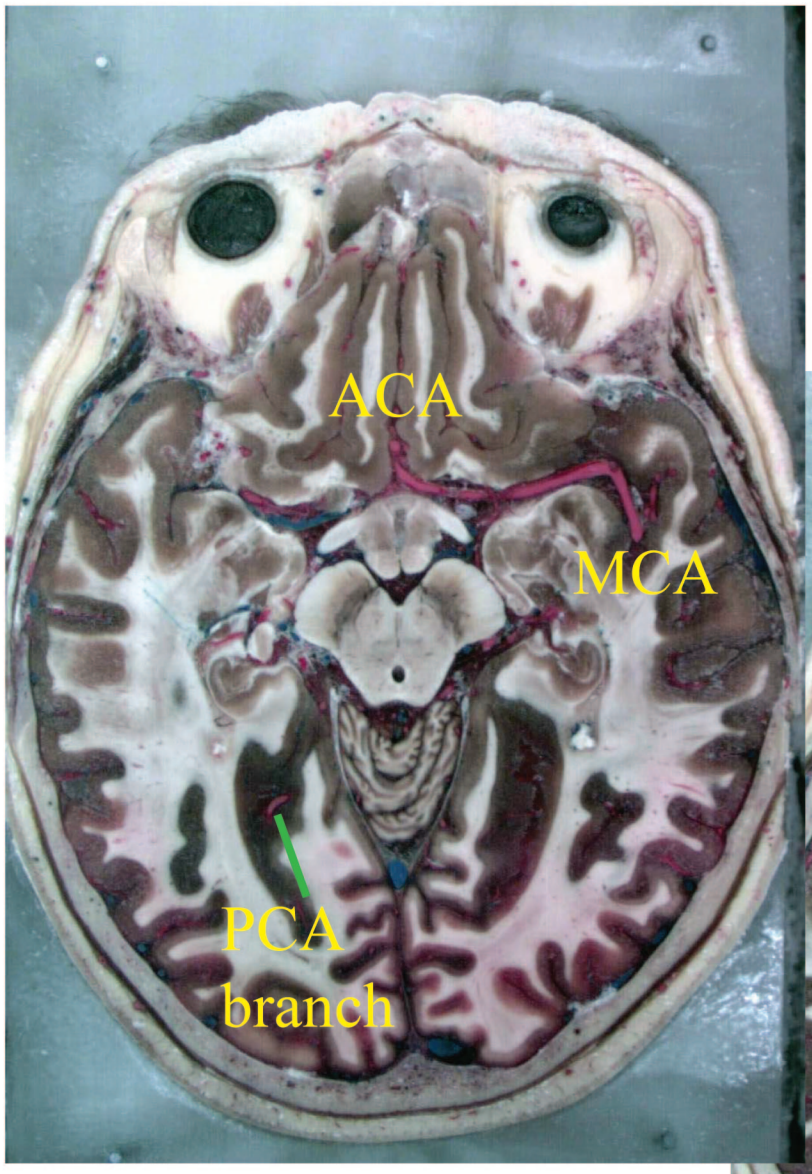
More branches of the COW. The acom is small, but clearly visible.

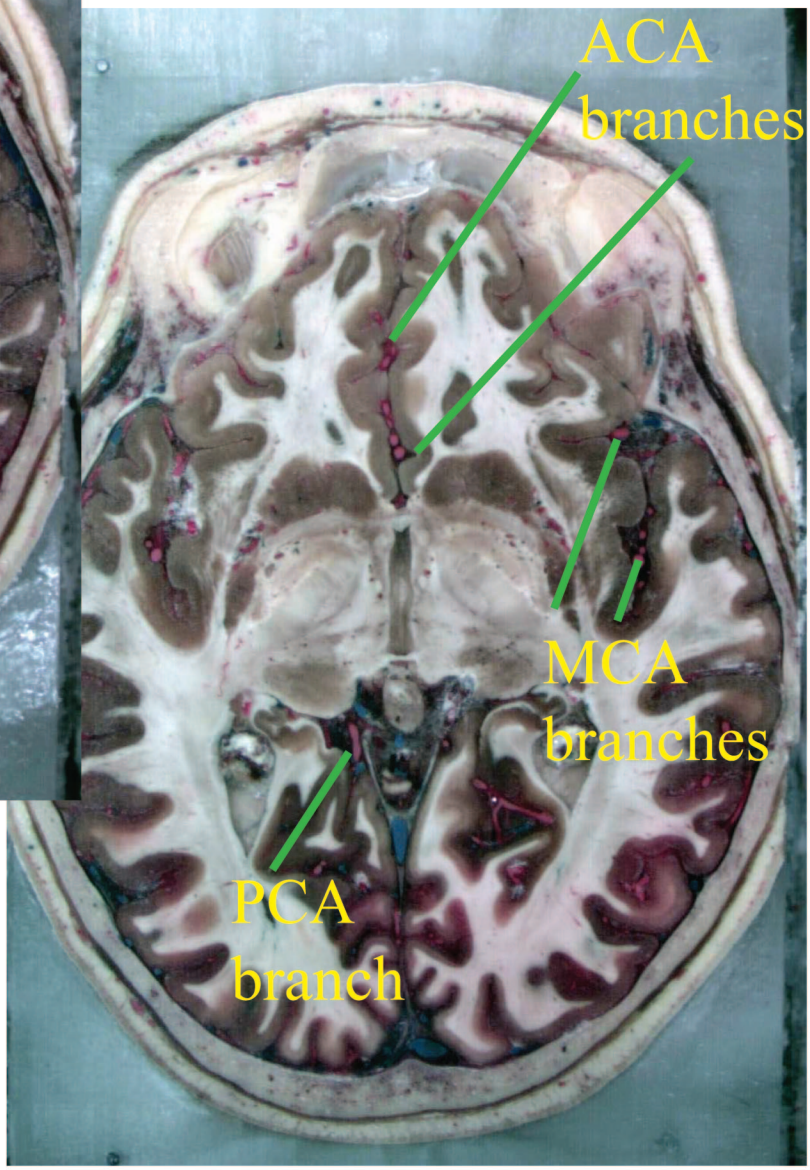


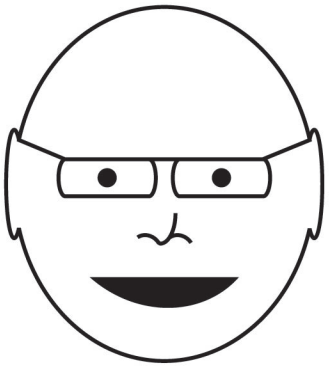
I think you should clean it up a little more.



We'll end the labeling of individual vessels with 2 more slices, succesively closer to the top of the head.

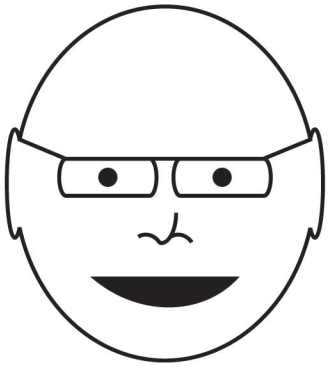




Lastly, we will overlay the vascular territories of the ACA (red), MCA (yellow) and PCA (green) on this image.

Hey wait a minute, if the COW is such a great supplier of collateral blood flow, how come people get strokes?



For 2 reasons: 1) many times, the COW is not complete ie there are missing connections and 2), once a terminal vessel like the MCA is occluded, collaterals are usually not up to replacing the absent blood flow. That's all that we have time for this week kids, join is for another thrilling adventure next week! And keep drawing!