Peristence & Creativity

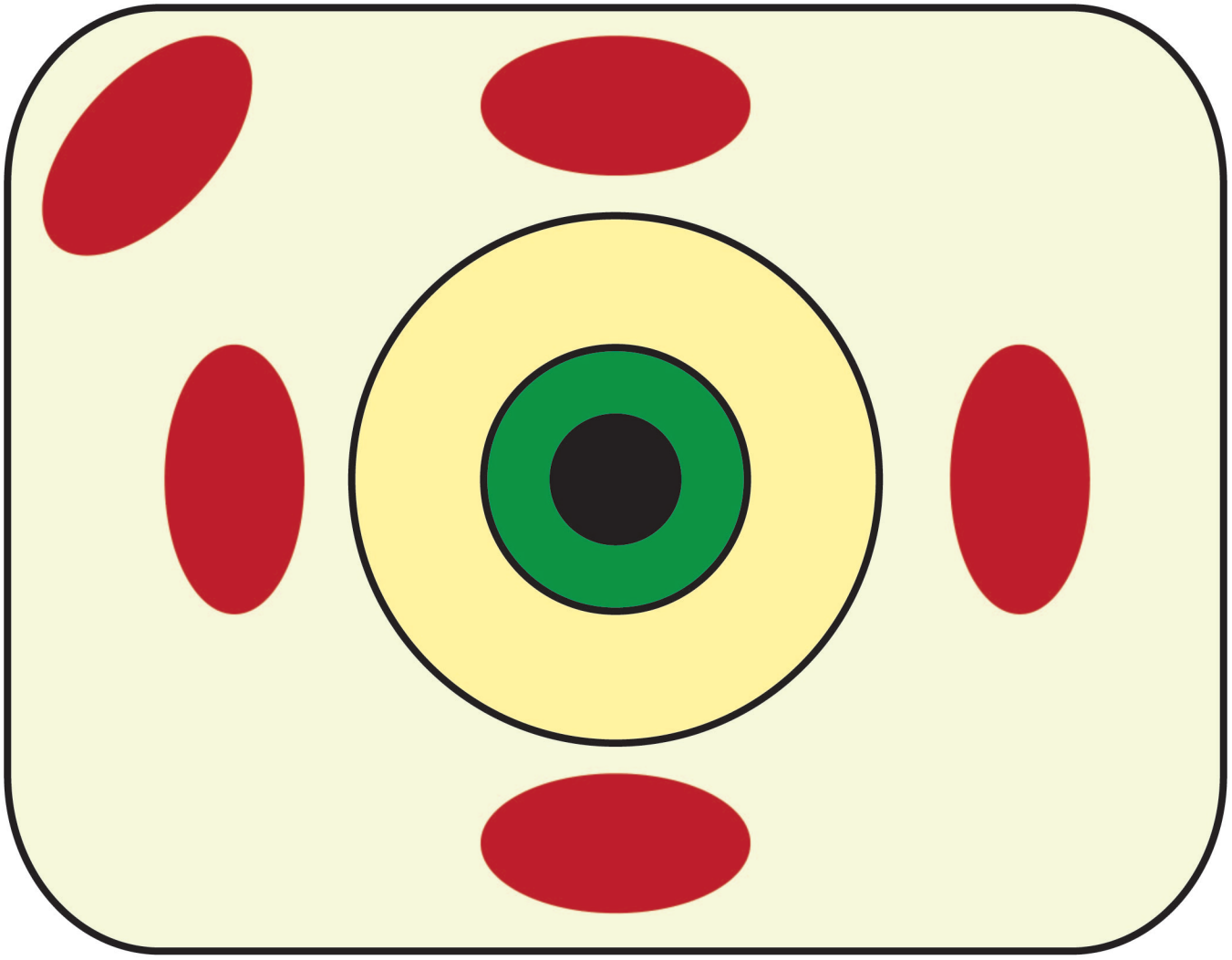
Anatomy Comics, Objectives 9.1, 9.2 and 9.3

Simple Comix

9.1 Identify the bones and foramina of the orbit.

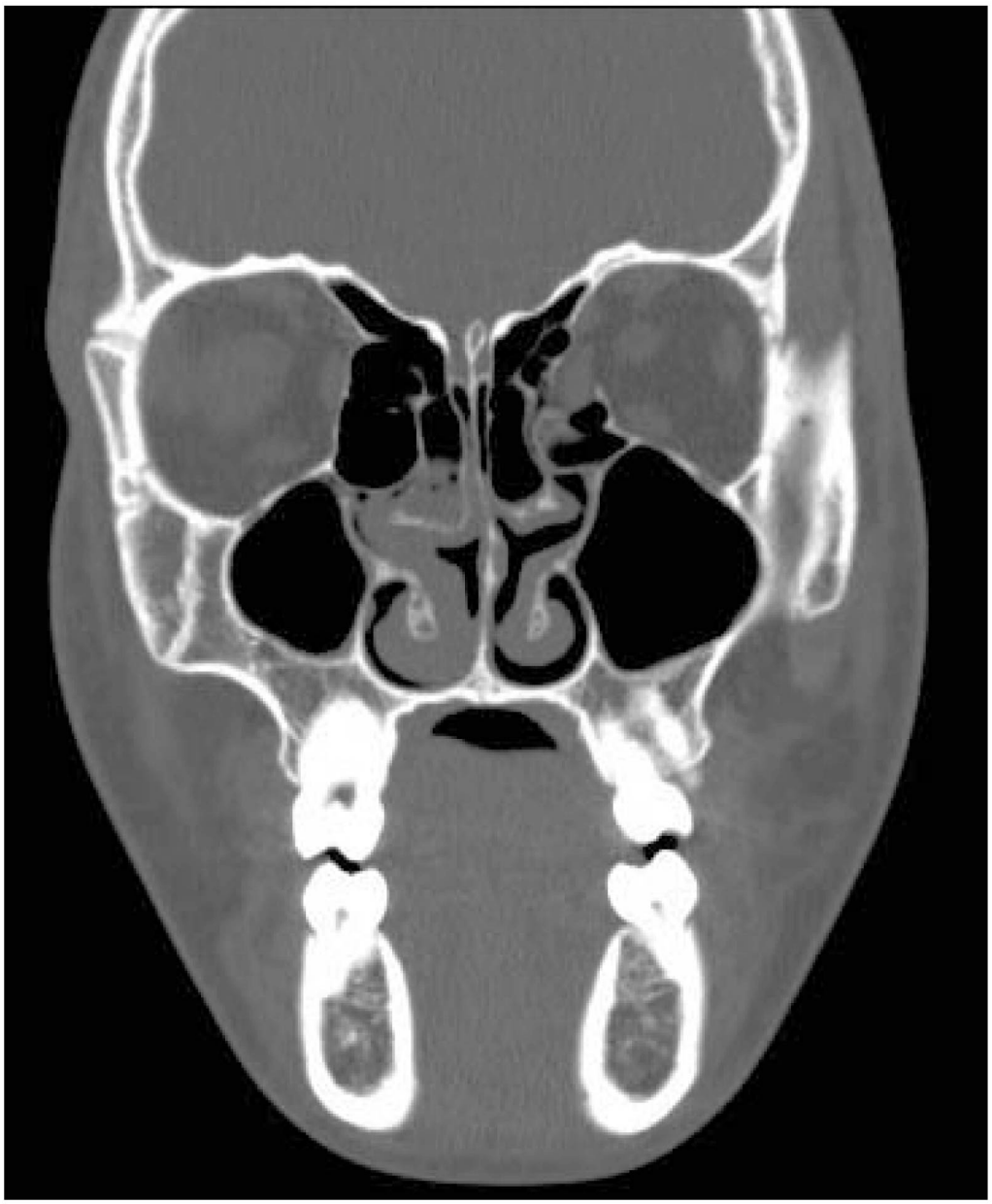
9.2 Identify the extra-ocular muscles. Demonstrate the orientation of the eyeball in the bony orbit.

9.3 Identify the individual action of the extra-ocular muscles. Demonstrate how each muscle contributes to the common clinical test for eye muscle function and the rationale for any differences between their individual actions and the clinical test.

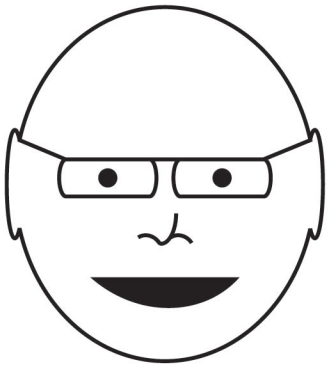


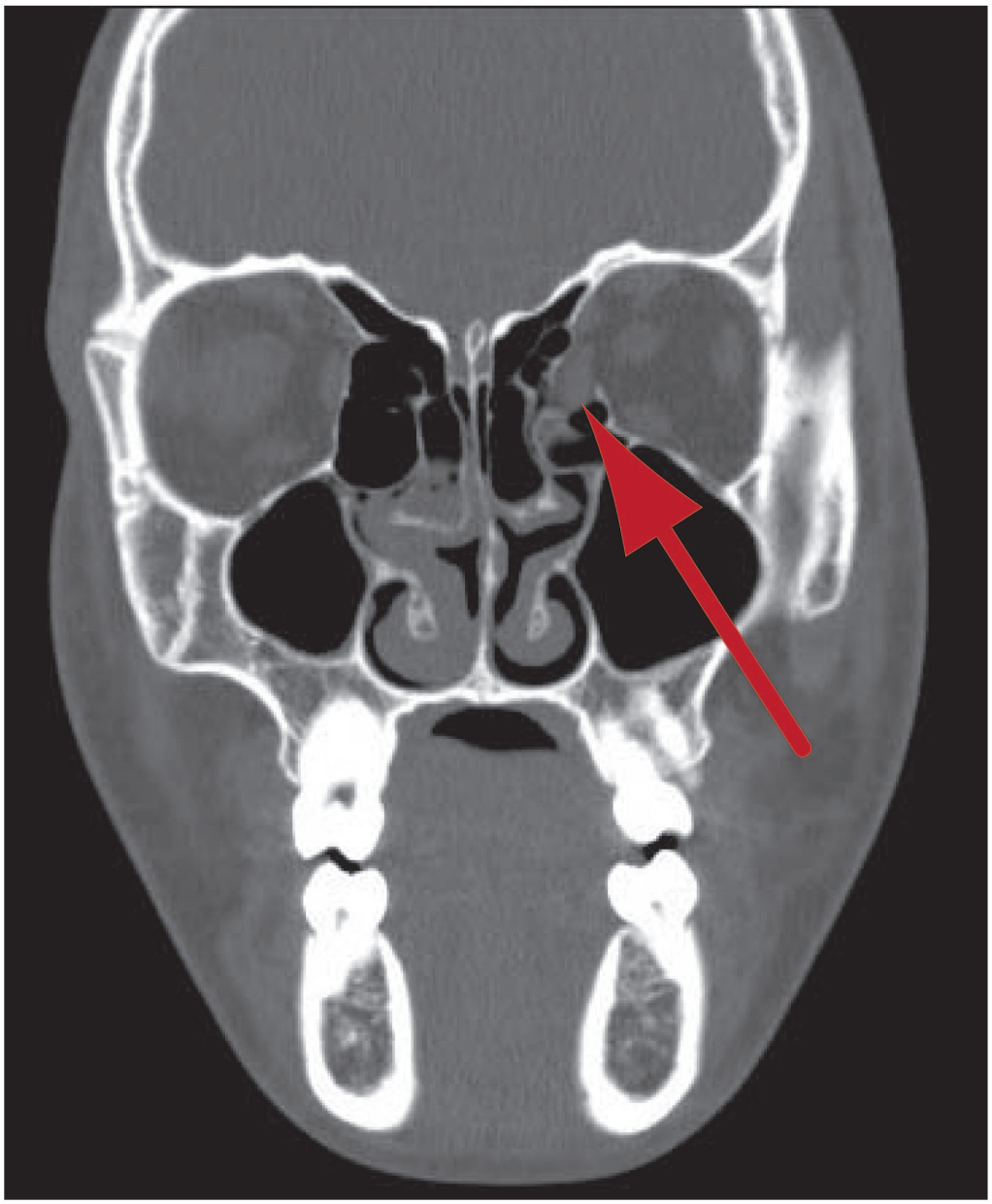
1. A 15 year old boy presents with oribital pain and swelling after a blow to the left orbit. Which bone is fractured?
A. Sphenoid
B. Frontal
C. Ethmoid
D. Maxilla

2. Name the “entrapped” muscle and predict the fuctional significance.
A. Medial rectus, loss of eye abduction
B. Medial rectus, loss of eye adduction
C. Inferior rectus, loss of upward rotation
D. Inferior rectus, loss of downward rotation

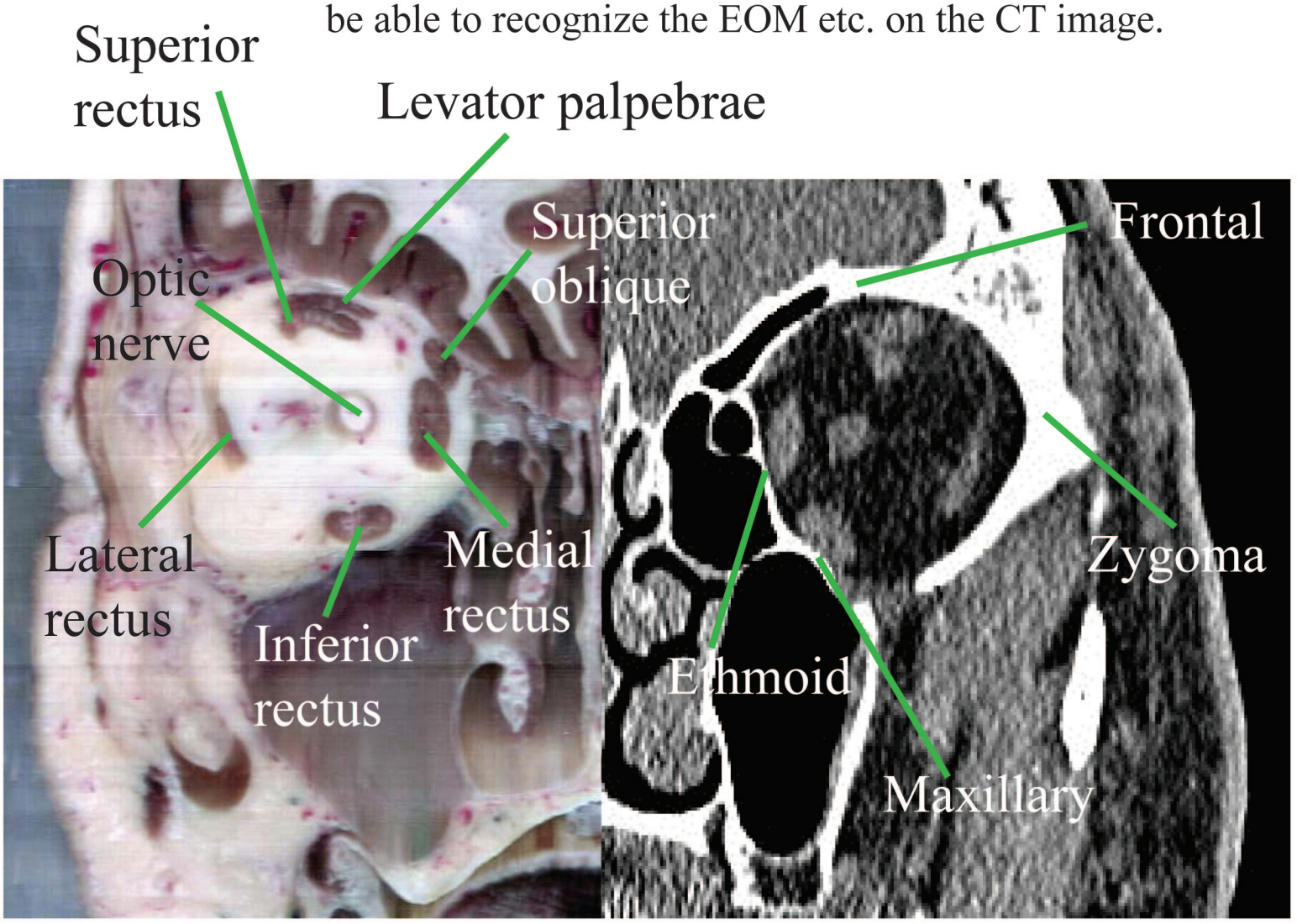


The ethmoid bone is fractured, with herniation and “entrapment” (ie muscle got stuck and won’t work anymore) of the medial rectus muscle. I put an arrow on the fracture and the entrapped medial rectus, displaced medially through the ethmoid fracture. The result of this injury is loss of adduction of the eye.

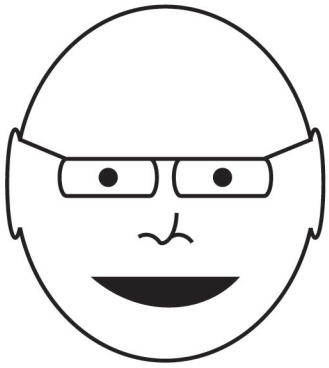


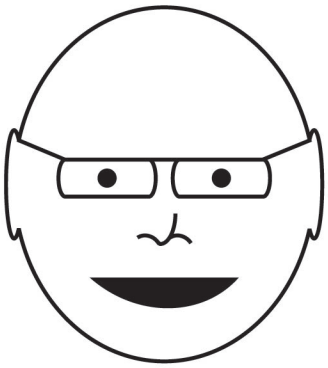


Time to learn some facial anatomy, my favorite. We will look at the anatomy of the orbits at two different levels in the coronal plane, then we (ie me then you) will draw a composite picture that summarizes some of the important features. Our first slice is located just posterior to where the optic nerve enters the eyeball. I have labelled the extra-ocular muscles (EOM), the levator palpebrae and the optic nerve on the visible human image on the left and have labelled the bones on the CT image on the right. You should be able to recognize the EOM etc. on the CT image.

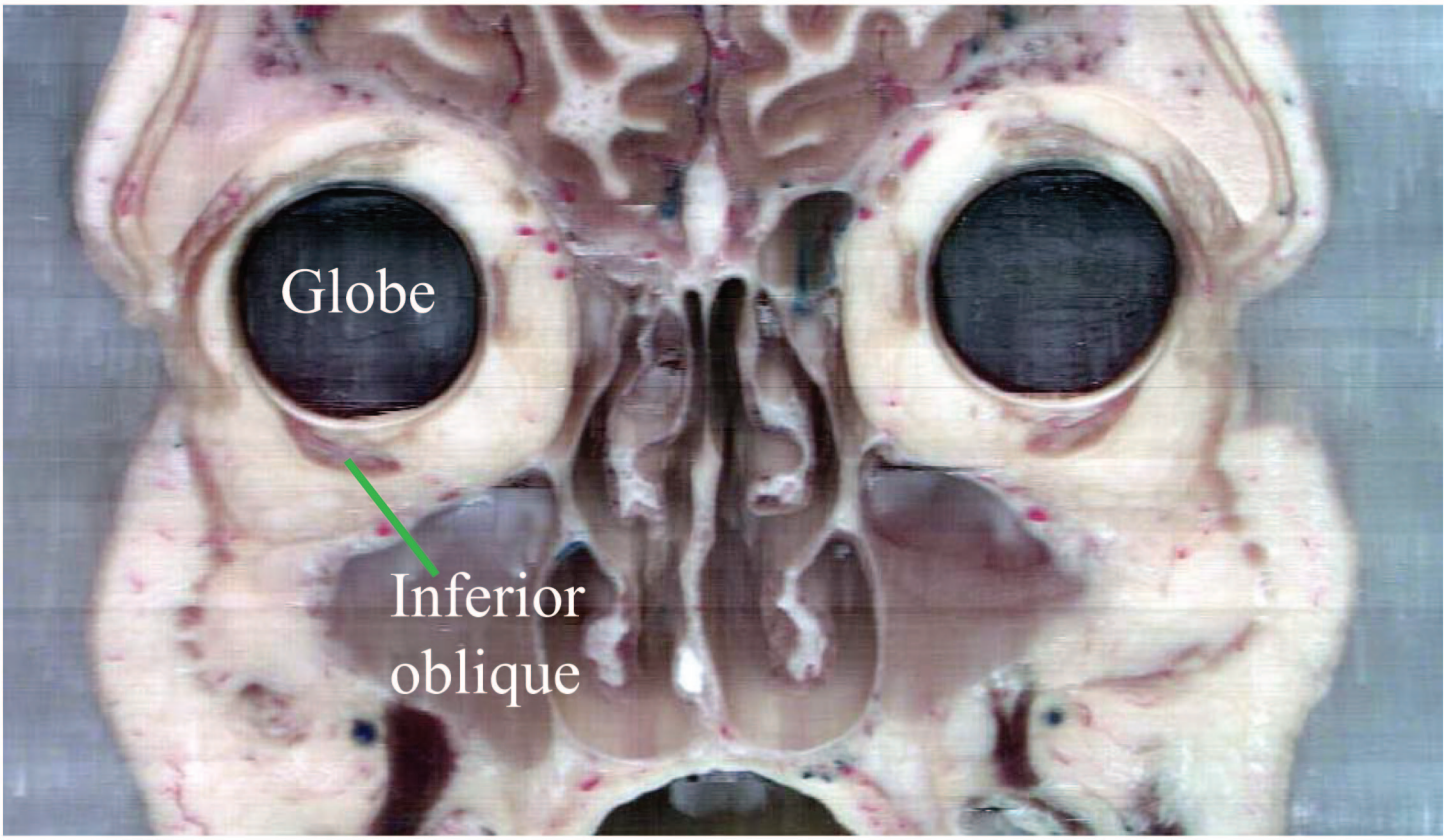


Look at the thickness of the four walls of the orbit, medial (Ethmoid), lateral (Zygoma), roof (Frontal) and floor (Maxilla). The thinnest ones, the medial wall and floor are at highest risk of fracture following a blow to the eye (ie fist) that causes a rapid increase in intraorbital pressure. This type of fracture is called a blow-out fracture.

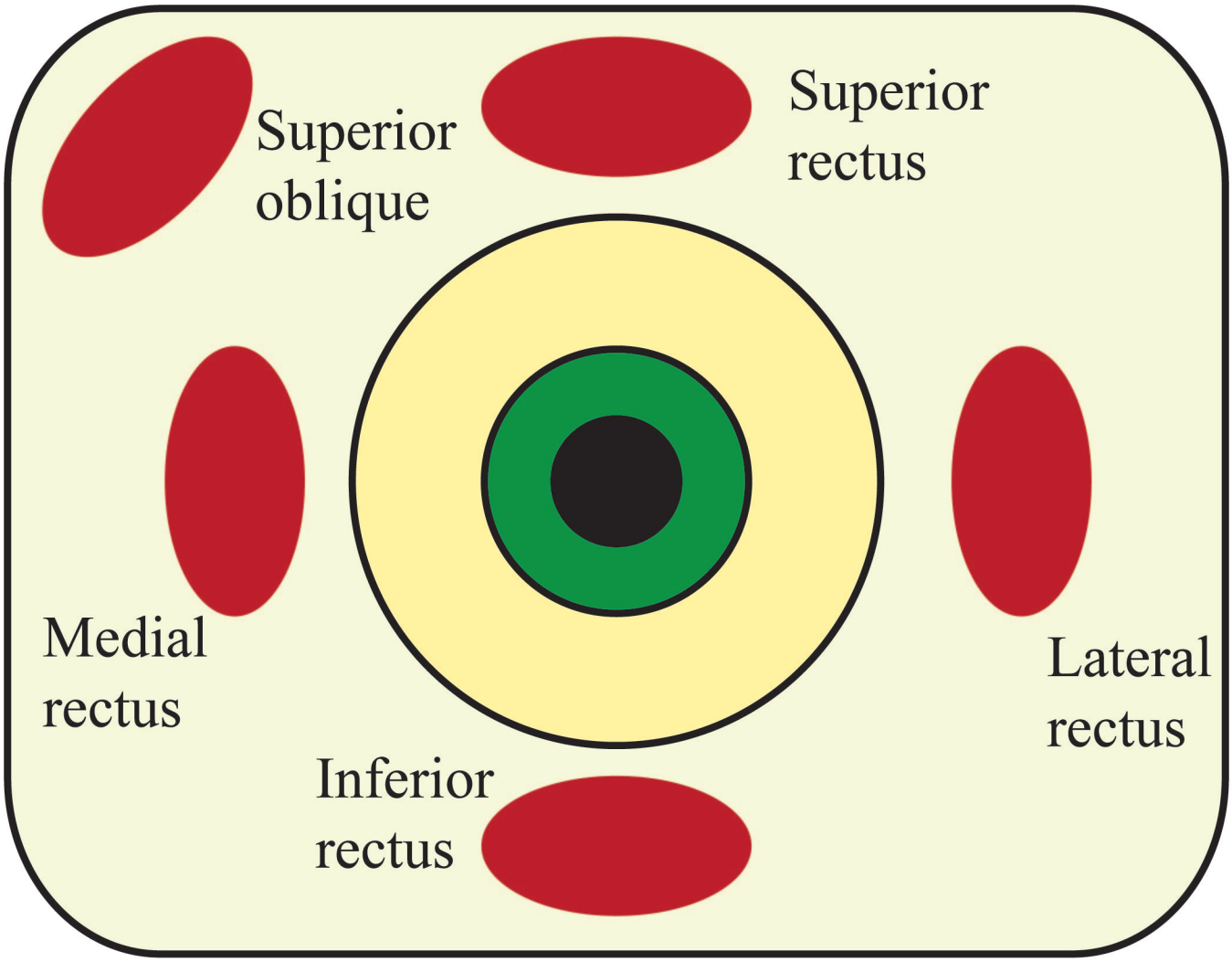


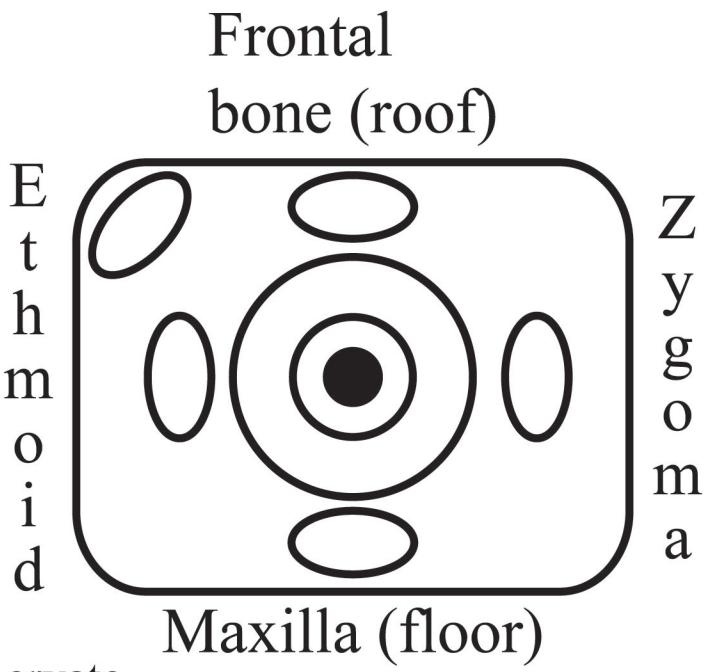


In a blow-out fracture, whatever musle is adjacent to the fracture may be dragged through the orbital wall defect and “entrapped”, imobilizing that muscle. Let’s go ahead and take a look at a coronal slice anterior to the one we already looked at, one that includes more anterior structures like the globe and the inferior oblique muscle.

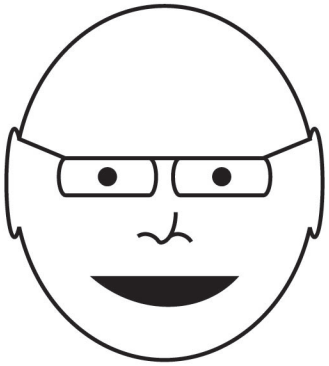


Looks like we’re ready to draw our picture!





We kept our picture simple. At top is a color version to highlight the muscles, at right is a black and white picture that you can draw yourself. We left out the inferior oblique for purely aesthetic reasons, but we stole a nicer version from Wikipedia that we will show you on the next page. Don't forget to label the bones, and learn the nerves that innervate the EOM and be able to predict the consequence of nerve/muscle injury.



Wikipedia is good stuff. This illustration was made by Patrick Lynch.

We run more of a bare bones operation.