Art in physiology: Chordae tendinae, Papillary Muscles, Trabeculae and moderator band

anterior cardiac physiology

Posterior cardiac physiology

Heart valves

Simple Line drawings & constructing a study page

Week 2 recap: You have practiced drawing from a grid, continuing with some exercises on controlling your pencil and shading

This week: **Anatomy of the interior chambers- focus on chordae tendinae, trabeculae, & papillary muscles**

There are a few main interior structures: Papillary muscles,trabeculae and valves.

This week we're focussing on all the stringy looking structures

For each session you will be given tasks to improve three elements of your critical thinking;

1. Accuracy
2. Draughtsmanship
3. Knowledge of cardiac anatomy

Right ventricle from the front- gross anatomy

1. Accuracy

Accuracy/draughtmanship

1. *This took a couple of hours – its like a sketch for your book-Using grids see my example in thee video*
2. Positioning of all those stretchy structures is tricky, and layering with pencil gives a sense of depth.
3. **Using an HB pencil**
   Make lightweight preparatory sketching marks first to plot the basic dimensions, these marks can be removed later.

4. If you start with a lighter shade, it will disappear as you shade darker tones.
5. Think about the basic shapes within the subject that you are trying to portray by identifying simple geometric shapes. Take some measurements of the subject, such as height and width. Look at those negative structures.
   Remember you will be starting with the lightest shades first (I started with a 3H)- so decide what that will be. If you have a reference shading panel use that to decide which pencil shade you want to use.

6. As you get darker , its akin to bringing the nearest structures into focus.
7. You can go back using lighter shades- at the end I used an HB to differentiate the upper and lower regions
8. Feelings about trabecula? Describe all of this in your own words- What do they look like to you? How do these structures make you feel? Write this in your book.

https://franscienceart.com/wp-content/uploads/2020/12/trabecula-and-moderator-

band.mp4

2. Knowledge of anatomy

By the end of this lesson you must know :

What is the function of the trabeculae carneae?

What is the function of the moderator band?

What is the function of the papillary muscle?

What is the function of the Chordae tendinae?

Answers below

Relating what we see to what we think we see
Image
Relating what we see to what we think we see

Often we see images like this- but it incredibly difficult to relate what we have seen in reality to the image.

Go to next tab:

Image

Try and identify and label the following anatomical structures correctly on YOUR drawing.

Right Ventricle from the FRONT

1.Anterior Cusp of tricuspid valve

2. Ascending papillary muscle

3.Ascending aorta

4. auricle of right atrium

5.chordae tendinae

6.Inferior vena cava

8.Posterior of papillary muscle

9.Pulmonary Trunk

10.Right atrium

11.Moderator band OR septomarginal trabeculation

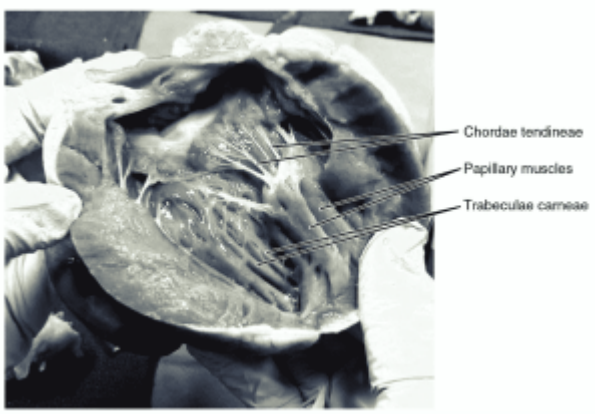
12.Septal papillary muscle

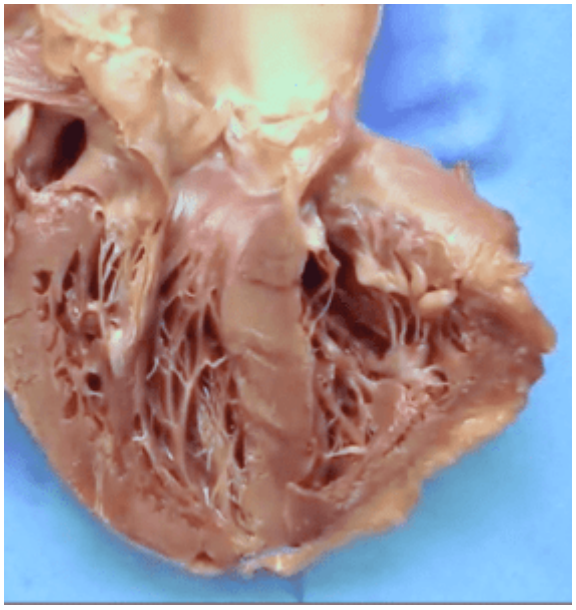
13.Superior vena cava

Image to label
Other views
Labelled cartoon on heart interior
Image to label

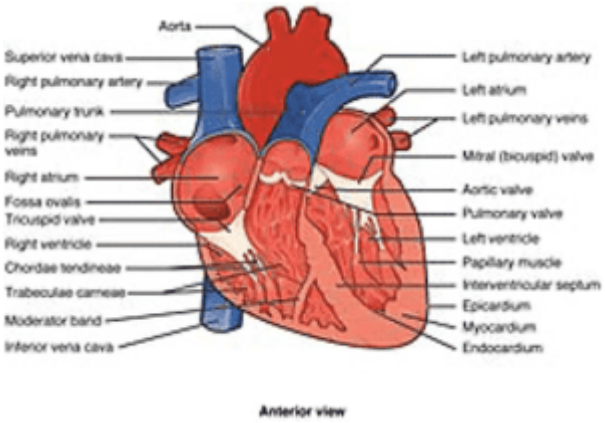
Right ventricle from the front

Other views





Labelled cartoon on heart interior

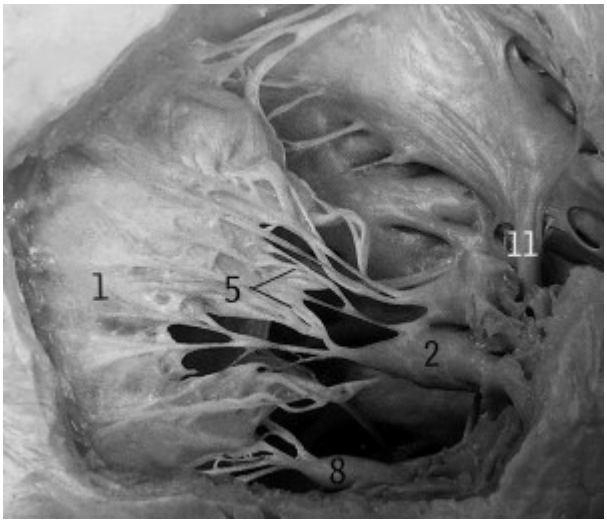


Final labelling
Cheat Sheet
Final labelling

Hopefully after a bit of work you should have identified through observation alone those gross anatomical structures

see next tab

Cheat Sheet



Focus in on this picture , you should see the numbers-

3. Draughtmanship

1. Label those essential elements and in doing so find out what on earth each of them does……

General Points
Physiology and Function- trabecula
Physiolgy and function moderator band
Chordae tendinae and papillary muscles
General Points

In observing and drawing these structures- you need to keep asking yourself- what is the point of all that?- why is it shaped like that?

Why is it not shaped another way?

Evolution has enabled this structure to be the optimum in order to get the job done

Physiology and Function- trabecula

Trabecula- if you look it up – always references the bone- and thats because its another one of those words that is not exclusive to the organ in which it is found.

Trabecula is a support or anchor to a framework of parts- actually it isn’ t really visible in your drawing- as it is at the back behind the papillary muscles. However there is an image of them in one of the tabs above.

Physiolgy and function moderator band

The moderator band acts as part of the electrical conduction pathway of the heart

Chordae tendinae and papillary muscles

Papillary Muscles: prevent leakage through the AV valves during systole (Mitral and tricuspid). They contract when the myocardia contract and in doing so prevent the valves from inverting (prolapsing) during systole.

They pull on the chordae tendinae to help to open the cusps when the ventricles are relaxing and filling with blood- occurring in both right and left ventricles

The chordae tendinae maintain the position and tension on the valve leaflets at the end of systole. Connected to the fibrous heads of the papillary muscles

You should now have a complete page, tracings, and annotations with notes. Do remember to date it. When you have done so, upload a PDF or photo of your work into the forum AND email to me

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