UNIT 7. DISSECTION: HEART

STRUCTURES TO IDENTIFY:
- Atrioventricular sulcus
- Interventricular sulcus
- Right coronary artery
  - Marginal branch
  - Sinoatrial artery
  - Posterior interventricular artery
- Left coronary artery
  - Anterior interventricular artery
  - Circumflex branch
  - Marginal branch
  - Posterior artery of left ventricle
- Right atrium
- Right auricle
- Sinus venarum
- Crista terminalis
- Sulcus terminalis
- Musculi pectinati
- Superior vena cava
- Inferior vena cava (and its valve)
- Ostium for the coronary artery (and its valve)
- Fossa ovalis
- Limbus fossa ovalis
- Sinoatrial node
- Atrioventricular node
- Right ventricle
- Tricuspid valve
- Trabecula carnae
- Septomarginal band
- Papillary muscles
- Chorda tendinae
- Infundibulum
- Pulmonary valve (anterior, right, left)
- Left atrium
- Left auricle
- Valvula foramina ovalis
- Left ventricle
- Mitral or bicuspid valve
- Interventricular septum
- Aortic vestibule
- Great cardiac vein
- Middle cardiac vein
- Small cardiac vein
- Posterior vein of the left ventricle
- Aortic valve (posterior, right, left)

DISSECTION INSTRUCTIONS:

1. Examine the pericardium and the heart in place before removing the heart from the body. The heart is held in place by the great vessels, which you will have to cut out. Identify the eight great vessels of the heart. The inferior vena cava ascends through the diaphragm and directly enters the right atrium. The superior vena cava descends into the right atrium. The pulmonary trunk ascends from the right ventricle, while the aorta arises from the left ventricle. The pulmonary trunk is anterior initially, but then goes posteriorly and to the left under the arch of the aorta, where it divides into the right and left pulmonary arteries. Four pulmonary veins, two from each lung, enter the sides of the pericardium and heart to drain into the left atrium (N. plates 206, 216; G. plates 1.41, 1.43, 1.44).
2. Cut each of the vessels you have just identified. Attempt to leave enough of the base of the vessel on each side of the cut for ready identification in the future. Specifically, cut the superior vena cava inferior to where the azygos joins it and cut both of the arterial trunks below the bifurcation of the pulmonary trunk.

3. Hold the heart to view it in anatomical position. The apex of the heart should point inferiorly and to your right (N. plate 212; G. plate 1.43). Identify the cut trunks of the eight great vessels and associate each with the appropriate chamber of the heart (N. plates 206, 211, 212; G. plate 1.44). Each of the two atria possesses a scalloped appendage called an auricle that hangs freely from the rest of the chamber. Immediately below each auricle is a part of the atrioventricular sulcus that indicates the approximate position of the four chambers (N. plates 211, 212; G. plate 1.43A, 1.44).

4. The heart tissue is supplied with blood by two coronary arteries (N. plates 216 - 219; G. plate 1.45-1.48). Typically the arteries lie on the muscular wall deep in the fat deposits. With a blunt probe, stroke vertically through the fat of the anterior interventricular sulcus to expose the anterior interventricular artery. Trace the artery superiorly to its origin from the left coronary artery and inferiorly toward the apex of the heart. Observe that the great cardiac vein accompanies the artery. Follow the left coronary artery until it splits into the anterior interventricular and the circumflex artery, which follows the atrioventricular sinus to the posterior side of the heart. The circumflex branch usually gives off a left marginal branch to the obtuse margin and a posterior artery to the left ventricle. The posterior artery travels with the posterior vein of the left ventricle. Immediately below the right auricle, find the right coronary artery in the fat of the atrioventricular sulcus. Trace this to the aorta and distally to the posterior side of the heart. Look for the artery to the sinoatrial (SA) node, which comes off of the right coronary artery near its origin and travels deep to the right auricle to the junction of the sulcus terminalis with the superior vena cava where the SA node is in the wall of the right atrium. Look for the right marginal branch along the acute margin of the heart. Here the right coronary artery turns to the left and runs on the back of the heart as far as the posterior interventricular sulcus, where it anastomoses with the left coronary a. They are covered by the coronary sinus, the final pooling of blood from the cardiac veins. The sinus empties directly into the right atrium. Look for the posterior interventricular artery running in the posterior interventricular sulcus to the apex of the heart. It is usually a branch of the right coronary artery and travels with the middle cardiac vein. Look for the small cardiac vein, which runs in the coronary sulcus (atrioventricular sulcus) between the right atrium and the right ventricle posteriorly; it opens into the coronary sinus near its termination.

5. Enter the right atrium by making a vertical cut that connects the superior and inferior venae cava (N. plate 220; G. plate 1.49). Remove blood clots and rinse the chamber clean. Observe the openings for the superior vena cava, the inferior vena cava and the coronary sinus. A thin valve with a single membranous flap protects the openings of the inferior vena cava and the coronary sinus. Observe the contrast in the texture.
in the anterior and posterior walls of the atrium. The posterior wall is smooth; this is
the sinus venarum and is continuous with the two venae cava. The anterior wall is
rough with the pectinate muscles, which contribute to its strength in contraction. The
two walls are joined at a ridge, the crista terminalis. The fossa ovalis may be visible
as a depression in the interatrial septum. This is a remnant of the fetal foramen ovale
and often remains patent in the adult.

6. Enter the right ventricle (N. plate 220; G. plate 1.50) by making an incision from the
cut edge of the pulmonary trunk downward through the anterior wall of the
pulmonary trunk and right ventricle to the acute margin. This incision should run
about .5 cm to the right and parallel to the anterior interventricular sulcus. From the
lower end of this incision, make another incision to the right, parallel to and just
above the acute margin to within 1 cm of the coronary sulcus. Wash out the chamber.

Observe the atrioventricular orifice connecting the two chambers. This opening is
guarded by the three flaps of the tricuspid valve. Identify these three flaps and note
that each is anchored by multiple thin chordae tendinae attaching to papillary muscles
that rise out of the muscular wall. The internal walls of the ventricle are lined with
muscular ridges called trabeculae carnae, which represent the termination of bundles
of fibers of the heart muscle. Look for the septomarginal band (moderator band)
crossing from the interventricular septum to the base of the anterior papillary muscle.
This band contains specialized muscle fibers that conduct impulses to the ventricular
wall. Follow the ventricle superiorly into the pulmonary trunk. Observe the
pulmonary semilunar valve and identify the three cusps.

7. Open the left atrium (N. plate 221; G. plate 1.51) by making two incisions in its
posterior wall. The first should run from side to side across the posterior wall parallel
to and just above the coronary sulcus. The other should be carried upward from the
middle of the first to the upper border of the atrium; it will cut the posterior wall of
the atrium longitudinally about halfway between the right and left pulmonary veins.
A third incision can be made transversely across the upper border of the atrium
between the two upper pulmonary veins. Rinse and clean the chamber. Its internal
walls are mostly smooth, except for a few pectinate muscles near the auricle. Identify
the valvula foramina ovalis. The atrium connects with the left ventricle via the
bicuspid or mitral valve.

8. To open the left ventricle, enter the scalpel below the coronary sulcus and carry it
downward through the wall of the left ventricle along a line slightly to the left of the
anterior interventricular sinus to the apex of the heart. The same incision should be
continued upward from the point at which it was begun through the coronary sulcus
and the wall of the ascending aorta. This incision will cut the circumflex branch of
the left coronary artery. The ascending aorta and the left ventricle should be opened,
rinsed and cleaned (N. plate 224; G. plate 1.52).
Again observe the chordae tendinae, papillary muscles and trabeculae carnae. Identify all three cusps of the aortic semilunar valve. Locate the entrances to the two coronary arteries immediately superior to the semilunar valve. Notice that when the valve is open and the flaps are pressed against the wall of the aorta they block the entrances to the coronary arteries (N. plates 222 - 224; G. plates 1.50-1.54).