BIO 380 Human Cadaver Dissection

Class Hours: 9-12 in Room SC 225 & 227 (Prosectorium) M-F
Instructor: Michael P Scola, DPM
Office Hours: By appointment
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The goals of this course are to provide the student with a greater appreciation of human anatomy through the hands on approach of preparing incoming cadavers for use in upcoming anatomy and physiology courses. This entails the development of various surgical/dissection techniques as well as review of the anatomical features of interest.

This course is designed to enhance the student’s knowledge of anatomy using a regional approach and is not intended as a replacement for an anatomy (and physiology) course. Areas of focus include, but are not limited to, the muscular, cardiovascular, digestive, integumentary, respiratory, and reproductive systems. Students are expected to come prepared for each lab with knowledge of anatomical structures of interest in the region they will be working on that particular day. Additional student-led study may be available based on dissection progress and time constraints.

**Student Learning Outcomes**

Upon completion of this course, students should be able to;

1. Apply various dissection techniques appropriate to preserving anatomical structures on the human cadaver.
2. Identify and distinguish key anatomical features of the human body.
3. Produce high quality dissected cadavers useful in subsequent teaching and demonstrations.
Assessment

Evaluation will be made of student preparedness, ability to effectively display anatomical areas of interest via dissection and one assigned project. Brief quizzes may be given on the regional anatomy to be worked on for that day to show preparedness for dissection. Learning materials and regional anatomy guides will be posted on Blackboard under "Course Documents"

Grades are based on preparedness, overall quality of technique / outcome and quizzes given prior to class.

Estimated Schedule of Progress

Week 1  May 9-13  Introduction, Surgical Techniques

Posterior dissection (back, arms, legs)

Week 2  May 16-20  Continue posterior; begin and finish anterior surface features

Week 3  May 23-27  Begin and finish internal organs;

Topics of interest as time allows

Cadavers and areas of dissection will be assigned during the first class. Reference material will be made available to aid in preparation for upcoming classes. Knowledge of structures of interest (muscle, nerve, vessels) in areas being worked on is vital to performing at a high level and is expected.

If you have questions, please ask before cutting / dissecting.

Code of student rights and responsibilities:

http://www.nku.edu/~deanstudents/Rights-Contents.htm
A. Human Anatomical Gifts
Our cadaver was obtained from the University of Cincinnati College of Medicine. Persons donating their body receive no financial compensation; this is truly their ultimate gift. Hence it is imperative that proper respect be paid to the cadaver at all times. **No body parts, tissue, etc. will be removed from the lab.** Disrespect for the cadaver will not be tolerated. You will observe professional conduct while in this lab and outside of the lab particularly if you discuss anything related to the cadaver in a public place. **Photographs may not be taken in the lab except with written consent of the instructor.**

The cadaver is returned to the University of Cincinnati at the end of the academic year. The family's wishes, i.e. internment/cremation, are fulfilled upon return of the body.

B. Care of Cadavers
The cadaver has to be kept moist at all times. The cadaver is covered with towels moistened with embalming fluid (2 Phenoxyethanol or Biostat). Only uncover the area you are studying/dissecting when possible. Occasionally mist the area you are working on using the spray bottle containing embalming fluid. When you are through, replace the towel and cover the entire body with the body bag.

C. Laboratory Access
The lab is locked when not in use. If you want to use the lab outside of class times, you need to contact me for keycard access. Only students enrolled in the course are allowed in the lab. **DO NOT BRING IN FRIENDS OR VISITORS!** Check with me if you have questions regarding visitors to the lab.

D. Laboratory Safety
a. **ATTIRE:** Cadavers are embalmed with a fluid containing glycerin, ethyl alcohol and phenol. Physical contact of your skin and clothing with the cadaver should be avoided. **You are required to wear disposable gloves at all times while working in the lab.** Nitrile gloves are available near the sink. Do not use the latex gloves because they are less able to withstand the embalming chemicals.

Wear old clothes and a long-sleeved lab coat while working with the cadaver. **Lab coats may not be worn outside of the lab.** Dirty lab coats are a health hazard and are offensive. **No open-toed shoes or sandals are allowed in the lab.** Wear shoes that cover your entire foot. Surgical masks will be provided upon request. Contact lenses should not be worn in the lab. Lenses can absorb chemical vapors; if you must wear contacts, you are required to purchase and wear vapor proof goggles.
b. PERSONAL ITEMS: Only your textbook and lab manual are allowed in the lab. Leave all backpacks or other personal items in the outer lab.

c. FOOD, DRINKS: Are not allowed in the lab.

d. TISSUES: All tissues removed from the cadaver must be collected and placed in the designated containers near the sink. These containers are sent back with the cadaver for cremation or are disposed of as medical waste. Do not discard paper towels, gloves, etc. in these containers: use the garbage can next to the sink. When you are through for the day, drain the excess liquid that has accumulated on the dissection table into the bucket located under the table. I will discard this fluid. Wipe up any fluid on the floor.

e. DISSECTION INSTRUMENTS: Should be washed well and left to dry before leaving. Soapy water should suffice, with a good rinse following. Scalpel blades should be placed in the sharps container. I will assist you should you feel at all uncomfortable removing a blade.

f. VENTILATION: The ventilation system in the lab is designed to remove air at the level of the cadaver and to reduce exposure to the embalming chemicals and odors. The ventilation system remains on at all times. There is a negative air flow to keep odors from leaving the lab. The door to the lab will be closed at all times. Do not prop this door open. If you experience respiratory difficulties while in the lab, leave immediately and contact me. If you notice an odor while in the outer lab when the door to the cadaver lab is closed, contact me.

E. Notes of Special Interest

This informational sheet is designed to alert you to the possible hazards of anatomy dissections and to provide you with some guidance on how to protect yourself.

EMBALMING CHEMICALS - A number of chemicals are used in various proportions to preserve cadavers. These chemicals are typically: formaldehyde, phenol, methanol, and glycerin. These chemicals may be hazardous if they get in or on your body. A great deal of effort has gone into reducing or eliminating any possible hazardous exposure while performing dissections. The embalming method, the laboratory ventilation, the personal protective equipment you are instructed to wear, and your training in proper dissection practices are all designed to help minimize your exposure.
FORMALDEHYDE – Formaldehyde is classified as a potential human carcinogen. It is part of the embalming solution at 1.9% concentration. In addition to preserving tissue for long periods of time it also acts to inactivate many microorganisms that may reside in the tissue. The permissible exposure limit for formaldehyde is 0.75 parts per million. Airborne concentrations of formaldehyde above 0.1ppm (parts per million) can cause irritation of the eyes, nose, and throat. Higher concentrations can be dangerous to life and health. Skin contact with formaldehyde can also result in various skin reactions, including sensitization. The concentrations of formaldehyde used at NKU for embalming are low. In addition, air monitoring for formaldehyde during anatomy dissections, for the most part, have indicated low levels. Wear protective nitrile gloves and a plastic apron. Wash your hands after dissections and, if you suspect contamination.

PHENOL – Phenol is another chemical that is used in the embalming solution at 9.3% concentration. It can cause irritations and burns and can have systemic toxicity. It has a characteristic sweet acrid odor that you most likely detect when you enter anatomy class. Skin contact is the major route of exposure of this chemical. Use nitrile gloves and a protective apron when performing dissections. Wash hands thoroughly after completion of your anatomy work or whenever you suspect that your skin has come in contact with preserved tissue.

METHYL ALCOHOL – This chemical is also used in embalming solutions at 11.1%. Contact with this chemical can result in irritation to the skin, eyes, nose, throat, and nervous system. It has a characteristic pungent odor. Prevent skin contact by wearing nitrile gloves and a plastic apron. Wash your hands carefully after dissection, or if you suspect skin contact.

GLYCERIN - Glycerin is used in the embalming solution at 11.1%. This chemical is an irritant to the eyes, nose, throat, and respiratory system. It is a colorless, odorless liquid. Prevent contact by wearing protective nitrile gloves and clothing such as a plastic apron. Wash your hands carefully after dissections or if you suspect skin contact.

INFECTIOUS AGENTS – Infectious agents are microorganisms that may cause disease in humans or animals. Much like chemicals, you can be exposed to infectious agents by inhalation, ingestion, injection or contact. Human tissues may contain infectious agents, however the embalming solutions used on the cadavers not only preserve the tissue but also destroy many infectious agents. In addition, the cadavers are screened and therefore are of low risk. To minimize the risk of exposure to infectious agents, make sure that the tissues with which you are working, have been properly preserved. Wear nitrile gloves and protective clothing.
such as a plastic apron or lab coat. Wash hands thoroughly after working with tissue or if you suspect that you may have been exposed. There must be no eating or drinking in work areas where tissues are present. Report all accidents to the course director.

**ERGONOMICS** - Ergonomics is the study of the physical relationship between the individual and their work. This relationship may be awkward or strained and must be adjusted to prevent discomfort. Often your awareness of body tension is sufficient to remind you to adjust to a more comfortable position. When performing dissections, get close to the area with which you are working, bend at the knees if necessary, avoid excessive repetitive motions, avoid extensive fixed positions and, take regular breaks to relax strained areas.

**PROTECTIVE EQUIPMENT** – Protective equipment is really anything that will reduce or eliminate the possibility of exposure to hazardous materials. Your clothing, a lab coat, apron, nitrile gloves, safety glasses and a respirator are all examples of possible protective equipment. Your typical attire for dissections should be as follows: old comfortable clothes, closed toe shoes, apron (lab coat if frequently washed), nitrile gloves, and safety glasses. Please note that latex gloves do not provide the same level of protection as nitrile gloves for the embalming chemicals used. Do not re-use gloves. Change them after 15 minutes of continuous use. Double-gloving prolongs use time.

**PERSONAL HYGIENE** – After you complete your work in the anatomy class, remove protective equipment such as gloves, apron and safety glasses and wash thoroughly with mild soap and water. Washing should be careful and deliberate, ensuring thorough cleaning of any possible exposed skin.

If you suspect that you have been exposed during the dissections, stop what you are doing, remove protective equipment and wash carefully as above.

**WASTE DISPOSAL** – All disposable protective equipment must be disposed as medical waste. Medical waste containers are located in each anatomy laboratory. Please remove gloves and disposable aprons and place these in the medical waste containers before you leave the laboratory. This equipment must not be worn in the hallways. The human tissue that becomes waste is collected in a red container at the end of the dissecting table during the semester and disposed at the end of the semester with the cadaver.

**2 PHENOXYETHANOL** – is the primary mold and fungal inhibitor in some “non-formalin” based wetting solutions. [For more information about the use of phenoxyethanol as a cadaveric wetting solution, see the journal article: Wineski...