

August 16, 2005

A Visual Guide to Human Dissection

Part of the Summer Computer Fellowship Program,
Sponsored by the Dean of Jefferson Medical College

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ABSTRACT

Medical school at Jefferson begins with a twelve-week course titled Human Form and Development which consists of Human Anatomy and Embryology lectures, and Human Anatomy lab. With just under 200 structures to be identified during the first week of anatomy lab, adjustments to medical school can be overwhelming. We proposed to create a human dissection video series as an additional media to help students learn anatomy. We completed 8 dissection videos; (1) superficial back, (2) deep back, (3) anterior chest wall, (4) thoracic situs and lungs, (5) heart, (6) mediastina, (7) suboccipital triangle, and (8) arm. The videos are currently available online via the Human Form and Development site on Pulse, and on DVD in the Learning Resources Center of Scott Library. The website will soon be available to all on JEFFLINE.

INTRODUCTION

Human Form & Development, the first course encountered by students when they begin medical school at Jefferson, is composed of Anatomy and Embryology. The Anatomy portion of the course is composed of a lab and lecture – the former of which we feel is of greater importance because to learn the lab is to learn anatomy. Learning the material, however, is a daunting task, given the inundation of new vocabulary and the precious but limited time available. Learning how to learn, in and of itself becomes an unforeseen task for many students who juggle with a variety of text books, reviews, lectures and so on. Regarding anatomy lab, the general list of resources consists of Morton's dissector, Netter's color drawn atlas, and a photographic atlas (usually Rowan's). Although each of these books aid in learning in their own way, each is also limited in different aspects. The dissector, for example, provides clear instructions on how to carry out the dissections but does not provide suitable illustrations to correspond. Netter's is an excellent tool to help memorize different structures but it has limited perspectives, and its paintings do not realistically reflect a cadaver. Rowan's atlas, on the other hand, provides wonderful photos of cadavers but is also limited in its perspectives and in labeling of structures.

Scouring the internet for additional resources, we hit upon two useful human dissection video series; one prepared by the University of Michigan (http://www.med.umich.edu/lrc/coursepages/M1/anatomy/html/courseinfo/video_index.html) and the other by the University of Wisconsin (<http://www.anatomy.wisc.edu/courses/gross/>). We realized then the benefit of having a video series to learn anatomy, and felt we could create an ideal series - one that would be tailored to the Jefferson curriculum, easily accessible to the Jefferson students, and hopefully better than what was currently available. With this idea in mind, we contacted Tony Frisby, Ph.D. and Richard Schmidt, Ph.D. and proposed our project (to create a human dissection video series) as part of the summer computer fellowship program.

MATERIALS & METHODS

The cadaver, tank, and dissecting instruments were provided by Dr. Schmidt and the department of Anatomy. Project development and webpage design were supported by Dr. Frisby and the Academic and Instructional Support and Resources (AISR.)

department. Production equipment--such as the camera, computer, and editing software--was provided by us.

Using the Morton dissector as a guide, we created a storyboard for each lab outlining the various structures to identify, and followed appropriate instructions to perform the dissections. The labs were completed in the order arranged in the dissector, beginning with the back, and moving on to the thorax. A great amount of time was spent on each lab to ensure that relevant structures were clearly discernible. We filmed dissections as they were carried out, in order to demonstrate technique and to capture certain aspects of the cadaver that would be lost as we progressed with the dissection. Originally, we intended to use Medical Media Services to film for the identification of the various structures required for the course; however, we found our own filming to be superior, and so continued to film all of the identifications with our camera, at the angles and screenshots we found to be most suitable.

After filming, video clips were captured from the raw footage by connecting the Canon Optura 50 miniDV camera via Firewire to an iMAC, and then edited, using the software Final Cut Pro 5. The clips were appropriately trimmed and arranged onto a timeline, to create video sequences for each lab. Frames of the structures that needed to be identified were exported as PNG still images using QuickTime Conversion, to be altered in Photoshop CS. In Photoshop, each structure was individually highlighted, using the Lasso tool to select the structure, and then altering the color by changing the Color Balance. Within each video, each structure shown was highlighted in a color that was maintained in all the different perspectives of that structure, in order to make identification and orientation easier for the student watching the video. Once the color was added to the still images, they were imported back into Final Cut Pro 5, and reintegrated appropriately to the sequence timeline. The titles of each of the labs, as well as all the names of the structures, were written using the program Live Type, and again imported into Final Cut Pro 5 to be placed with the corresponding images. The final product then showed the video including the highlighted structures and their names appearing in the same frame. Using QuickTime Conversion, completed videos were exported in .mov format, to be later compressed into Flash format for the internet, and to be exported to iDVD to create DVDs.

RESULTS

Using over four and a half hours of raw footage we were able to create eight dissection videos, each running from 3 to 15 minutes in duration. The eight labs include: superficial back, deep back, anterior chest wall, thoracic situs and lung, heart, mediastina, suboccipital triangle and arm. We burned the eight videos onto four DVDs to create a two-case set, complete with labels and cover cases. Three copies of the DVDs, titled *The Visual Guide to Human Dissection*, are available at the Scott library in the Learning Resource Center. Additionally, the website allows students to access the high quality flash videos from the comfort of their own homes using Pulse. Currently, the website is accessible only to students registered for the Human Form & Development course (i.e.

the class of 2009); however, plans are underway to make the website available through Jeffline, thereby giving access to all interested.

DISCUSSION

At the outset, we wanted to create a video dissection series for Jefferson, and we are pleased to say that we are well on our way and have set the foundation for this long-term project. With two people working together, we expect the project will require at least two more summers to complete. Due to the structure of the webpage created by Sean Dyer, the addition of new videos to the website will be quite simple. We recommend that students film as they dissect, using the same production equipment that we used and intersperse editing with dissecting.

Our next step is to create a survey that will be completed by the first-year students at the end of their anatomy final exam. The survey will hopefully provide constructive feedback on the video dissection series, its use, benefits as an educational tool, how to improve it for the next year, and so on. The information gathered by the survey can be utilized to continue the project and tailor it to better suit the needs of the students. Additionally, we hope that watching the videos will generate some interest in the class of 2009 to continue the project towards completion.