

Problem Statement:

The first year medical school curriculum of Jefferson Medical College provides an excellent basis for the understanding of gross anatomy from a “surface down” perspective. However, due to the nature of laboratory dissection there is a limited ability to view and learn cross-sectional anatomy. Yet the ability to understand cross-sectional anatomy is vital to physicians practicing in the world of modern imaging techniques such as MRI and CT. These scans offer tremendous detail, yet they are often oriented in a cross-sectional manner that is quite different from the view that is learned in gross anatomy lab.

Therefore, it is important to introduce students to cross-sectional views of the body early in their medical training. In addition to preparing students for their clinical years, adding cross-sectional anatomy to the current method of learning gross anatomy will enable the student to view anatomical structures in a variety of ways, thus allowing a better understanding of the overall composition of the human body.

The Visible Human Dissector lessons address the need for an introduction to cross-sectional anatomy, through both cross-sectional views of a cadaver and CT images. The lessons also reinforce three-dimensional gross anatomy. The combination of the cross-sections, CT scans and three-dimensional models allows for an excellent overall understanding of the arrangement of structures in the body by providing a variety of perspectives. This combination of views is illustrated in Figure 1.

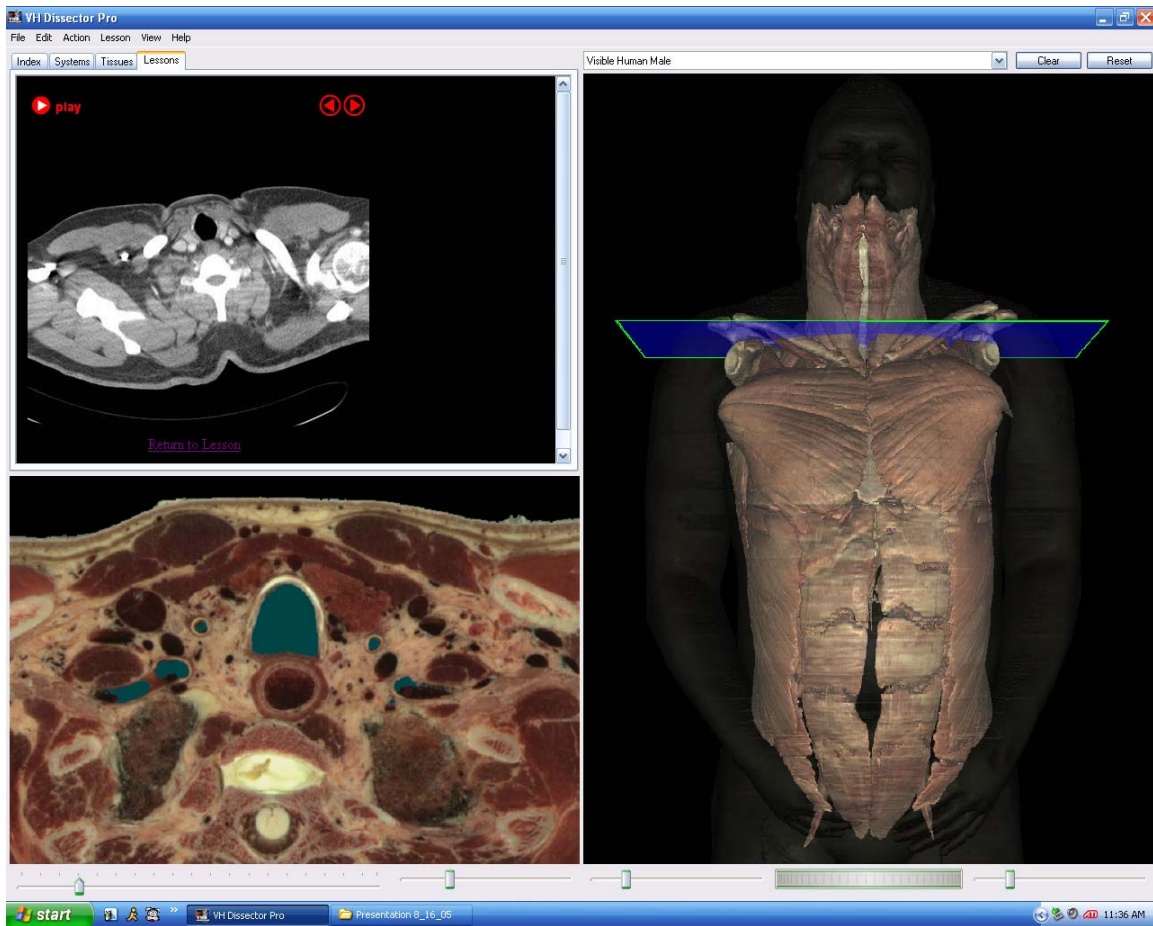


Figure 1

Goals:

Initially, I had set a realistic goal of completing four laboratory dissections over the course of the summer. Dr. Lopez suggested that I start with the thorax, and therefore I began coding anterior chest wall. I then moved on to the lungs and finally to the heart. In addition to the basic Visible Human lesson that includes a 3-dimensional model and cadaveric cross-section, I also wanted to include CT scans.

Challenges:

A variety of challenges occurred in the production of the Visible Human lessons. The initial problem encountered was the lack of instructional material detailing how to develop a lesson plan. Without specific instructions on how to write the HTML code for a lesson, I was forced to copy an example lesson included in the Visible Human Dissector program. Because of the manner in which the VH Dissector program modifies the user-written HTML, using the example lesson code as a template caused me to include excessive HTML code into the lessons that I wrote.

Another difficulty I faced was the lack of suitable CT images to use in the lessons. Dr. Hector Lopez provided a few EZ DICOM files that I was able to use, but overall there was a lack of quality images.

The final, and perhaps most frustrating, challenges were the software bugs in the upgraded versions of the Visible Human Dissector software. A glitch prevented the user from saving during lesson development. The program's manufacturer, TOLTech, is still working to resolve this issue.

Outcomes:

Although my goal was to complete four lessons, I was only able to finish three lessons. The software issues mentioned in the Challenges section prevented me from completing development of the four anticipated lessons. Because of the loss of time I plan to continue working on VH lessons during the school year. My new goal is to create as many lessons as my time during second year will allow. While not specific, I think

this is a reasonable and realistic goal. Any additional lessons will be beneficial to the first year medical students in the future.

Overall, I think the lessons that I created will be extremely helpful for gaining an understanding of the positional relationship of anatomical structures when viewed from a cross-sectional perspective. Additionally, the flash movies should provide students with a great introduction to CT images and allow the student to follow structures through the body.

Next Steps:

As I mentioned previously, I would personally like to continue creating lessons during the school year. Additionally, I think that it would be very worthwhile to have a current first year student develop lessons during the summer of 2006. The more lessons available, the better the understanding of cross sectional anatomy will be amongst first year medical students. Also, after having utilized the lessons created this summer to study, next year's summer intern would better be able to add and modify features that would aid in learning.

Along those lines, an important next step for this project would be a brief instructional lesson for faculty and next year's intern on how to properly write the HTML code for the VH Dissector program. While the HTML itself is very standard, the style that is necessary to be compatible with the TOLTech software is slightly different than one would expect from merely looking at the code of existing lessons.

Final Comments:

Overall, the Visible Human Dissector program is an amazing resource for learning anatomy. The first year introduction to cross-sectional anatomy should aid medical students as they progress through their training, allowing them to more easily read and comprehend cross-sectional diagnostic images. Hopefully the existing lessons will prove useful and Jefferson faculty and students will continue to develop Visible Human Dissector lessons.