Transcript

Episode 116

Why Anatomy & Physiology Students Need Sectional Anatomy

The A&P Professor Podcast

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Contents

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Introduction

Kevin Patton (00:00:00):

In his poem Song of Myself, section 51, the poet Walt Whitman wrote, "Do I contradict myself?/Very well then I contradict myself,/(I am large, I contain multitudes.)"

Aileen (00:00:17):

Welcome to The A&P Professor, a few minutes to focus on teaching human anatomy and physiology with a veteran educator and teaching mentor, your host, Kevin Patton.

Kevin Patton (00:00:30):

In this episode, Terry Thompson joins the conversation about deadline terminology, and she gives a new book club recommendation. I review a few slide tricks, and I talk about why our A&P students need to experience sectional anatomy.

Expiration Dates

Kevin Patton (00:00:51):

Back in the previous episode, A&P professor Jerry Anzalone had called in with a comment on the terminology we use when discussing deadlines, a topic which had come up in episode 112, and had sparked some conversation in the A&P Professor Community and in social media.

Kevin Patton (00:01:12):

In responding to Jerry's comments in episode 115, I mentioned the use of the term best-by date by Wendy Riggs and others. That discussion in turn motivated listener Terry Thompson, to write in with some additional commentary. Here it is.

Kevin Patton (00:01:34):

"If Wendy's best-by term seems too light for some, maybe try expiration date instead of deadline. I always used due date, but thinking more about it, I like the idea of expiration date because that better implies potential consequences. It also indicates that the assignment itself has expired. So, it will be justified if any makeup is of a different format or timing such as I did all the makeup exams near the end of the semester before the cumulative final exam. I preferred that so students would stay focused on new material moving forward.

Kevin Patton (00:02:21):

"Otherwise I saw that most students would focus on the previous information until the makeup could be scheduled and then always seemed to be playing catch-up the rest of the semester. And that affected their learning success. From an instructor work perspective, it also reduced frustration from students who needed early makeups and then ended up dropping the class. So, all that extra effort on my part seemed, well, useless.

Kevin Patton (00:02:52):

"My first thought of an analogy for students was an expired driver's license or tag or inspection sticker, but with racial inequality and escalation over traffic stops, well, that's not a good one anymore, but expiration of credit card would be a good analogy. You can't buy what you want right now, but with some time and effort, you can fix that problem. For food or over-the-counter drug dates, best-by means you probably will be fine past that date. Just not the best quality. While expiration date means it could be dangerous and should be discarded."

Kevin Patton (00:03:40):

Well, thanks Terry, for sending that in. As I think about this whole thread of discussion, it underscores two things for me. One is that words do matter,

and there are probably all kinds of terms and phrasing that I use in teaching that have meanings beyond my intent.

Kevin Patton (00:04:02):

And so, I ought to keep paying attention to these things and keeping open to what others are doing or saying about them. Another thing that occurs to me, as it usually does, is that there are so many thoughtful and creative people teaching A&P and, well, I can learn from them.

Kevin Patton (00:04:26):

Do you have something to contribute to this conversation that I can learn from or that others can learn from? Or maybe this sparks something else that you think we ought to be thinking and talking about? Well, be like Terry and Jerry and call the podcast hotline at 1-833-LION-DEN. That's 1-833-546-6336, or send in an audio file or written message to podcast@theA&Pprofessor.org and jump right in.

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Kevin Patton (00:05:02):

If you've been listening to this podcast for a while, you know that for every episode we provide a searchable transcript and a captioned audiogram, and those are sponsored by AAA, the American Association for Anatomy. One of my favorite things about being a member of AAA is their journal for evidence-based teaching and learning anatomy and physiology. It's called Anatomical Sciences Education and there's always something, something in every issue that gets me thinking and rethinking and thinking again about the way I teach A&P. They have a lot of other resources for teaching A&P, too. I can access the histology image database, virtual dissection database, radiology and other medical images, sectional images from the Visible Human Project and, well, all kinds of stuff that helps me teach A&P. Check them all out at anatomy.org. Just click the resources tab, then teaching resources and you'll find some amazing stuff there.

Slide Tricks (Again)

Kevin Patton (00:06:19):

We are now well into the academic conference season, aren't we? Of course, academic conferences happen, oh, many times throughout the year, but they seem to really ramp up, at least the ones that I'm most interested in ramp up in spring and summer. And so, we're right in the middle of that as I record this. And so, yeah, I've been seeing a lot of presentations, mostly virtually right now, but some of you have been going to face-to-face conferences as well. And in either venue, we're going to see a lot of slides. I mean, slides are very effective tools for getting our points across. And, of course, we use slides a lot in our teaching for the same reason, because they can be very effective. Now, slides get a bad rap because, yeah, they're overused. And in my estimation, they're often used incorrectly.

Kevin Patton (00:07:14):

They're not really used in the best way that they can be used. And what I mean by best way is the best way for student learning. And, of course, in seminars, we're doing learning, too. We're not exactly students, but we're still trying to get a point across and we're trying to help those that are participating in that seminar or conference or webinar or whatever it is to learn something new, to grow in understanding.

Kevin Patton (00:07:44):

And so, this has kind of been a pet project of mine is to better myself in my own use of slides and also to help mentor others to do that. I mean, that's literally part of my job. In the HAPI program as a faculty member, that's part of what we do is mentor our students to help them develop their own style of practice in using slides, when to use them, when not to use them, how to use them effectively, what are some tricks that we can use to make them better?

Kevin Patton (00:08:18):

And you've been listening to this podcast for a while. I, every once in a while, just get on a tear about slides. And I'm about to do that again, although this is shorter and more of a review of some key points, because I'm reminded of it. Since we're in the middle of all this, I've been in the middle of conferences and single standalone presentations and so on. I see some really good slides and really good slide techniques. And I've seen some really bad slides and really bad slide techniques. And so, I just want to kind of bring this to the fore again.

Kevin Patton (00:08:58):

Now, if you're interested in the whole collection, it goes all the way back to episode 66. So, I'm reaching way back there. Episode 66 was called slides serve the story of anatomy and physiology. And then, a little bit later in episode 89, we had a topic I called smooth teaching with slides, animations to dramatize the story of anatomy and physiology.

Kevin Patton (00:09:25):

And there's something from there that I want to reemphasize in this segment. So, hold on and I'll get to that in just a moment. And then that was episode 89. Episode 95, I titled that More Slide Tricks, and then episode 96 was Even More Slide Tricks. So, I'll have links to all those previous episodes in the show notes and at the episode page.

Kevin Patton (00:09:48):

Thinking about this from the presentation side of things, from the teacher side of things, one thing that I've noticed a lot more of lately is people wanting to use more of the features of slides. And so, they're using some of these fancier animations and transitions. Now, in slide lingo, an animation is some kind of movement you do within a slide. A transition is some kind of movement you do as you move from slide to slide. They work similarly in whatever slide format you're using, whether it's PowerPoint or Google Slides or whatever.

Kevin Patton (00:10:33):

The thing that I want to emphasize right now is that we need to be careful about using the fancier effects. Those fancy effects are really good if you're trying to do something very dramatic or you're trying to do some particular thing with, let's say, an object on your slide or something, and you wanted to do something that using an animation or a transition from one slide to the next makes it look like it's moving in the kind of way you want it to move without taking it to Pixar Studios and having them do it in a really smooth way. You're trying to make it work with the spinning and sliding and fading and so on of the animations or transitions between slides. And that's great if that's what you're trying to do and you're only doing it occasionally, or you're doing it for dramatic effect, but again, only occasionally.

Kevin Patton (00:11:33):

But to have a spinny or slidy kind of animation in every slide, or maybe as you go from bullet point to bullet point, or you have some dramatic transition in every single slide or you're switching back and forth between very dramatic transitions.

Kevin Patton (00:11:52):

So, as we move to slide number two, the whole thing spins around like a block. And then in transition three, it explodes and goes into slide number four, whatever. You know what I mean? All these things, it'll get very cartoony and that's distracting and we don't want to distract. We want our slides to support our story. We don't want them to be the center of attention. When they're the center of attention, then we've just disrupted our story. So, we want to avoid them for that reason, but another reason to avoid them and I've mentioned this in past episodes is that there is a certain percentage of our students who are going to have some physical problems with that. They're going to be prone to vertigo or some similar condition where even very slight sliding of something across a slide can cause some problems for them.

Kevin Patton (00:12:52):

And I didn't realize how many people there are that are like that. I mean, there really are quite a few people and it's become kind of habit for me because my wife is like that. She gets vertigo when I'm showing her something on a computer screen and I'm just scrolling down the screen to get to a different part of that webpage. She has to look away.

Kevin Patton (00:13:14):

And so, I'm constantly reminded of that issue within my own household. And so, it's probably easier for me than most people to pay attention to that. But I've had a number of students who have had much worse reactions than my wife does, often through maybe some kind of brain injury or some other kind of condition. Maybe we don't know the source of it, but we know that's the result of it. And like I say, there's more out there than we think.

Kevin Patton (00:13:42):

So, I think that we probably ought design our slides assuming that there's going to be at least one person seeing this slide that's going to be like that. So, if we're going to use something slidy or spinny or dramatic in any way, some exploding thing or something, then we probably want to be super sensitive and really think, "Is this really going to accomplish an important goal? Is it really worth risking that? Or should we tone it back a little bit?"

Kevin Patton (00:14:09):

So, I'm not saying, "Never use them," because I use them sometimes. Sometimes that's the only choice to have an effect that's really going to support my story. But I want to keep this in mind.

Kevin Patton (00:14:21):

Another thing that is probably, oh, the worst mistake that I and other people make and, yes, I make it all the time, even though this is kind of a pet peeve of mine and that is putting too much text in our slides. Too much

text in general, there are some presentations I see. And they're just all text, slide after slide of text, and there are no images whatsoever. And I know there's a general principle that you should never put an image that doesn't have a purpose. Well, I don't know. I would interpret that. I think it's best to think of decorative images do have a purpose. Their purpose is to make the slide more interesting and inviting and engaging.

Kevin Patton (00:15:05):

Now, I'm not saying necessarily purely decorative, but they don't necessarily have to send a message or portray a message that isn't also portrayed in the verbal story that you're telling, the oral story that you're telling, or the text that you're using in there. So, yeah. Go ahead and add some images. And nowadays boy, there are all kinds of collections of all kinds of photographs and drawings and so on that you can put in there, or you could even repeat an image from a previous slide or preview an image from an upcoming slide, maybe remove the label so they're not distracting because you haven't gotten to that content yet or you've already covered that content. You don't want the student or the viewer thinking about those things.

Kevin Patton (00:15:50):

So, there's all kinds of options there for adding an image. That's part of what I'm talking about here, but don't make all your slides all text, but when you do use text on a slide, I think it works best if it's very, very, very telegraphic. And what I mean by that is, in the olden days, when they sent messages by telegraph, it was per word or per letter. And so, there were very brief, very brief messages sent on purpose because it just costs too much to send a whole sentence. So, you tried to say it in as few a words and as short and simple words as possible and that's the way we should do the text on our slides.

Kevin Patton (00:16:37):

We don't want whole sentences. We don't even want long phrases and we don't want that because we are verbally telling this story. We want students to be listening to our story, not reading something up on the slide. That's

not what the slides are for. That's what the textbook is for. That's what a handout is for. That's what maybe a webpage or some other resource is for, but the slides? No. The slides are there to just be markers to help illustrate our story and to kind of show students where we are in our story. So, it's best to think of the text as sort of a little marker to say, "Well, we're in act one, scene two here and just have a short little snippet of what that's about." Where we're at. We're in the liver or we're talking about hepatocytes now or whatever it is that we're doing and not the whole definition of a hepatocyte and location of a hepatocyte and all that stuff.

Kevin Patton (00:17:36):

Maybe just a picture of a hepatocyte's all you need. And okay, put the word up there because if you haven't given your students an outline, then maybe they don't know how to spell hepatocyte without interrupting your story and asking you to spell it for him. So, go ahead and put that up there, but that's all you need is that one word.

Kevin Patton (00:17:56):

Another thing that I've noticed people have trouble with ... Well, I don't think they have trouble with, I don't think they trouble themselves with fonts. The size and readability of the font is important. I've seen slides with fonts that are just tiny and light, meaning not very bold and they just can't be read from a distance or even close up can't be read. And they're sitting there in the middle of a slide in a sea of a white background or maybe a color background or something, but there's all this room to make the font bigger and people don't. And a lot of times they choose a font that is real fancy or real odd or whatever, thinking, "Whoa, this is going to really dazzle my audience." No, it's not. It's going to distract them and it's going to make it hard to read.

Kevin Patton (00:18:47):

And if you do a web search of easy-to-read fonts, you're going to find that you already have the fonts you need. You may be already using some of those fonts like Arial font. That's a good one to use. I use Verdana a lot. I think that one is really easy to read and it's a little, slightly on the bold side,

usually depending on what size it is. And, by the way, we usually size fonts by points, but the point isn't really the size of the font or the size of the letters or characters. It's the size of the little block of lead that it would be on if this were an old-fashioned printing machine and the characters don't always take up all that height. So, you can't really tell how big a font's going to be by how many points it is because a 24 point font in one font family can be a very different size than a 24 point font from another font family.

Kevin Patton (00:19:46):

So, what you need to do is just experiment and see what is going to work best in terms of visibility and not just visibility, but readability. And some people with reading issues like dyslexia and other kinds of reading issues find that certain fonts just make it that much harder for them to read. And so, if you do a web search of finding the ones that are most readable, then you might want to keep that in mind as you're choosing your font.

Kevin Patton (00:20:17):

And you don't want to go back and forth between a bunch of different kinds of fonts. You want to find one that works well for you and kind of stick with it and just use the effects within that font group. So, use effects like increasing or decreasing the points that is the font size, using bold face or not bold face, using italic or not italic and use that rather than come up with a whole different font that you're using.

Kevin Patton (00:20:43):

Another thing that is good practice and makes things more readable and more usable for students and that is if you're going to have several different things on your slide, like maybe one or two images on your slide or maybe several different bullet points or lines of text on your slide or maybe a mix of multiple images and multiple lines of text on your slide. Well, number one, you want to question that. You always want to question that. "Maybe I only need one thing," and just use two slides instead of two things on one slide. That often works way, way better, because then you can just focus on one thing at a time because you can't be usually focusing

on both of them, but there are cases where you want to compare them, have them both there so you can compare them. So, yeah. Okay. Sometimes you need to do that.

Kevin Patton (00:21:33):

And when you do it, you need to space them out. I can't tell you how many slides I see where they're all scrunched together, where there's no space between bullet points. They're just all equal spaced. You need to add some space because when you're viewing it from a distance, it all just blends together. It's more load on your brain to have to figure out where the separation is than if you just put a little white space in there, just go ahead and space them out and space them out evenly, not randomly because then that's distracting. So, pay attention to the spacing of things.

Kevin Patton (00:22:08):

And a little slide trick that I've been using recently and maybe you have your own version of it. If you do, I'd love for you to call in and share it. But I was at virtual conference recently where there were a few slides here and there that I really wanted to capture and keep. And the promise was made that once the conference was over, that all the attendees would have access to the slide deck used by each of the speakers. And, of course, I never remember to go back and get that. And when I do, I don't remember which slides it was that really stood out to me because they're not being talked about at that moment.

Kevin Patton (00:22:48):

I mean, I will go back and get those slides sometimes, but what I often do and what I was just doing in a recent conference is I use a screen clipper called Snagit, and there are many other screen clippers out there. Maybe you have your favorite one, but the one I use is from the same company that does Camtasia. It's called TechSmith and they have a product called Snagit.

Kevin Patton (00:23:12):

So, that's always open on my desktop and so I'll have Snagit open. And when I see a slide that I'm like, "Ooh, yeah. I'm going to put that in my notes," what I'll do is I'll just click on the button on Snagit, click the slide and it'll be selected and then I'll hit clip it, take a photo of it. And then that goes into the editor and it actually gets saved in the editor. And the editor in Snagit allows you to add annotations. So, I can add a text note. I can add arrows, I can circle something, put a little callout box or something pointing to a part of that slide so I can mark it up.

Kevin Patton (00:23:50):

And then what I'll do is copy that from that Snagit editor and paste it into my digital notebook. I use OneNote, you might use a Google Document or Evernote or some other kind of digital note-taking process. And it works the same in all of them, whatever your favorite is. But I put mine in OneNote and then I can continue to add additional annotation. So, I can type in some text notes and say something about that slide or whatever. And maybe the next couple slides, I don't really need a copy of, but then that third or fourth slide after that. Yep. I'll do the same thing. Just mark it with Snagit, maybe mark it up a little bit and then copy it, put it into my digital notebook. And because it's saved in that Snagit editor, I can wait to the end and just all the slides I save from that one I can just during the break, just pull those into that page of my notebook and do it then. So, I can either do it on the fly or do it afterward, but just a little tip for people who are attendees of presentations, if they're taking notes digitally. So, that works really well for virtual conferences, not so much for face-to-face conferences, but there's a few slide tricks that I wanted to share with you.

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Kevin Patton (00:25:16):

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range of teaching experience from none to, well, a lot. What they all have in common is a desire to teach A&P effectively by learning collaboratively about contemporary teaching practice applied specifically to A&P.

Kevin Patton (00:25:56):

There's a new cohort forming right now. So, no matter how advanced your current credentials are, or how much or how little teaching experience you have, don't you want to hang out with us to deepen your knowledge and skills by joining us at the Northeast College of Health Sciences. Just go to northeastcollege.edu/hapi that's H-A-P-I, or click the link in the show notes or episode page.

Book Club: I Am Multitudes

Kevin Patton (00:26:29):

In a previous segment, I relayed a comment from Terry Thompson regarding terminology surrounding deadlines. When she sent that to me, she said that she had also read the book, Clean: The New Science of Skin by James Hamblin, which I'd recommended in The A&P Professor Book Club back in episode 114. And she said that she enjoyed it. And she also mentioned another book about the human microbiome. And, well, then I suggested that she send in a review of that one for our book club. So, here it is.

Kevin Patton (00:27:06):

"Kevin asked me to write a book review of I Contain Multitudes by Ed Yong. When I recommended it for his podcast and book club. Now, this is not to be confused with the similarly named Bob Dylan song or the line in Walt Whitman's Song of Myself poem. Although they all do share one common idea that everything really is interconnected.

Kevin Patton (00:27:31):

"The book's subtitle, The Microbes Within Us and a Grander View of Life truly captures the grand scope and perspective of this book. The book isn't all about humans, but that probably added to why I enjoyed it so much as someone with ethology, that is animal behavior background. We get to visit zoos and aquaria and field sites all over the world and deepen the oceans. We learn about pangolins and our pet dogs and bioluminescent squid and chemosynthetic giant tube worms. Although a 2016 publication date can seem a bit dated with the current pace of new research findings, it still seems so relevant in the current pandemic focus on microbes as enemies and public misunderstanding and mistrust of science. Yong's writing helps put nuance and acceptance of change and uncertainty in science back into perspective. Yong shares contributions from many active clinical and research labs. While the book mentions the virome, the focus is on bacteria except for bacteriophages.

Kevin Patton (00:28:52):

"I've recently been reading about the microbiome at all levels, from popular writing to research and clinical references to help our author team fine-tune the integration of this emerging topic into the patent textbooks. Even with that background knowledge, I learned more details context for the topics of endosymbiosis, gnotobiosis, and horizontal gene transfers, HGT, and their role in the microbiome story. As a teaching resource on the topic, it's well cited with 28 pages of notes and a 40-page bibliography.

Kevin Patton (00:29:36):

"However, the thing that most impressed me was the way Yong's balanced voice and curiosity is able to effectively communicate not just the interesting information, but the history and whole process of science. Although the development of the microbiome extends through the whole book, the history chapter's title of The People who Thought to Look captures his framing of Darwin's Infusoria, Leeuwenhoek's lenses, and the work of all the past to the current scientists.

Kevin Patton (00:30:18):

"Yong takes the process further to not only present the who, what, and where, but gets to the why, why not, and how questions of science and explains when and why answers to some of these questions are still not yet possible. Although you will not find the terms of correlation and causation in the chapter titles or index, dispersed throughout the book, Yong gives the best explanation and contextual presentation of these important science concepts for the general public that I've read so far.

Kevin Patton (00:31:01):

"To help readers understand the pace and role of the microbiome in the human, he uses analogies like biogeography and agriculture. He presents the conflict in deciding how to best address these microbes relative to humans, as it challenges the concept of an individual or self versus nonself. He also refutes the often presented 10-to-one ratio of microbes to human cells as instead being more equal, given the latest rough estimates of 30 to 40 trillion human cells and 39 trillion microbes.

Kevin Patton (00:31:45):

"He frequently reminds readers about the need to understand microbiome-related terms as neutral so they can avoid the two often inherent bias of a good versus bad dichotomy, when in fact both are possible in a given context. He also cautions about the need for healthy skepticism against the potential of overselling microbiome-related products and treatments.

Kevin Patton (00:32:15):

"I enjoyed Yong's science writing so much, I've gone back to review his various articles in The Atlantic related to the pandemic and have also added his next book to my wishlist, An Immense World: How Animal Senses Reveal the Hidden Realms Around Us, due to be released in June of 2022. Maybe I'll return with a review of that book if it relates enough to our teaching of senses in human A&P. Respectfully submitted, Terry Thompson."

Kevin Patton (00:32:50):

Now there's a link to Terry's book report, which I just read for you, which I'll tell you she did send in before the expiration date. And there's a link to the form to claim a digital credential after you've read the book. Do you have a good book of interest to A&P faculty that you'd like to recommend? Let's hear about it.

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Kevin Patton (00:33:13):

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Kevin Patton (00:33:59):

The annual HAPS conference recently wrapped up, but we have some regional conferences coming up. You can join me as a HAPS member and participate in anything you like at theAPprofessor.org/haps. That's H-A-P-S.

Sectional Anatomy

Kevin Patton (00:34:20):

I want to talk a little bit about sectional anatomy in the undergraduate A&P course that is organized by systems. I think we often forget about sectional anatomy when we teach in a systems approach and I don't think we're doing our students a great service when we completely forget about it. I would like to be more intentional about that, and I've been working on that

for quite some time. And so, I'm exhorting all of us to join in that effort of developing a habit of being more intentional about weaving sectional anatomy into the A&P course. And I think we can do that without adding a lot of extra intensity or rigor or extra work or even extra concepts and so on because sectional anatomy involves concepts that we're already trying to learn in A&P, right? I think it's a way that is going to help students learn those things and connect those concepts to each other.

Kevin Patton (00:35:26):

And one of the simplest things we can do that I think many of us forget, and I know it took me a long time to realize that I need to be doing this. And I'm still in the process of fine-tuning my habit of doing it. And that is, near the beginning of the course, we teach these ideas of what sectional anatomy is. We teach what a section is, what a plane is, and I'm going to circle back to that in just a moment, but we do that at the beginning. And then we kind of leave it aside and assume that the students have just absorbed that and they know it, but for them it's a separate thing. And when I start getting into the systems of the body and start looking at sections of the skin to look at the different layers of the skin, and I look at a sectioned long bone to see what's inside there and look at the marrow and what's going on, how it's built and and we do that system by system by system.

Kevin Patton (00:36:22):

And how often, when we are showing our students either a slide or a model or a specimen, do we stop and orient them to it first so they know that if we're looking at a section, like let's say in an illustration or a photograph, if we're looking at a section of, let's say, the kidney, which comes pretty late in the course. In the story of the human body, we usually don't start with the kidney. It's usually toward the end. Even that far along, the student might look at a frontal section of a kidney so that that we can tell them about the renal pyramids and the renal columns and the renal calyces and all that stuff. And we haven't stopped to tell them that, "Hey, now this is cut. We've removed the interior portion. And we're looking at the posterior portion of this kidney, and we're looking to see what's inside of it. And this

is the left kidney. And look, that's the lateral side of that left kidney. Here's the medial side of that left kidney. Here's superior, here's inferior."

Kevin Patton (00:37:29):

We don't do that. We just assume the students know what they're looking at, because we know what we're looking at. And how do we know what we're looking at? Well, we have way more training and experience than our students do.

Kevin Patton (00:37:40):

So, yeah, I hope we know what we're looking at. Although I got to tell you, I'm always looking through anatomy atlases and so on. It's always fun to look at those uncommon views of certain parts of the body. And sometimes it takes me a few minutes to orient myself and figure out where did they cut this heart because I'm having a hard time understanding exactly where this section is. Even for those of us that have been looking at the human body for decades and looking at illustrations and medical images of the human body for decades, sometimes we have to stop and think about what we're looking at.

Kevin Patton (00:38:19):

So, it's no wonder that our beginning students are going to struggle with that a lot more than we are. And I think it's up to us to kind of help them along. And so, if we can make a habit of whenever we're exploring with them a new image, we take just a moment and it only takes a moment to point out anatomical directions. And if it's a section, that we identify what plane that section was cut on and where in the organ that is and what exactly we're looking at and from what perspective are looking at it.

Kevin Patton (00:38:57):

I think if we consistently point out sections and bring in other kinds of sections, then we're necessarily typically going to see in a textbook or other presentation, because you can't have a million pictures of every organ in every region of the body in a textbook. Believe me, I've tried and you just

can't do that. I mean, A&P textbooks are way too big to begin with. And so, yeah, that ain't going to happen.

Kevin Patton (00:39:27):

So, what we need to do is supplement that judiciously and show students some pictures of sections and maybe even some medical images of sections such as CT scans or PET scans or sonograms or other kinds of images where we're looking at the body or part of the body in sections.

Kevin Patton (00:39:48):

As we begin to develop that concept of sexual anatomy that we can keep coming back to in our course, we need to really think about how we present those basics at the beginning, because I think a lot of times we just rattle off some definitions or even just have the students read that part of the book and don't even think about it. And I think that it requires more than that.

Kevin Patton (00:40:11):

So, we have to sort of identify some of the physical concepts or geometry concepts really like what is a plane? A plane is an imaginary infinite flat surface. So, it's sort of something that we have to picture in our mind's eye. And I was just reading an article recently that said that there's more people than you think that can't picture things in their mind's eye. They don't have a mind's eye and they were actually calling it that in the article, the mind's eye and that's something that needs to be developed in those people.

Kevin Patton (00:40:47):

And I just thought, "Really? How can someone exist that way?" But that's my bias that we all have, for our gut reaction is to think that everybody thinks the way we think. Everybody's brain works the way my brain works. And, of course, that's not true.

Kevin Patton (00:41:05):

So, we have to stop think about the idea of a plane. What is that? Do all my students really understand the idea of a plane and do they understand that a plane is different than a section, that even though they might have the same names like sagittal section or sagittal plane, a sagittal plane is an imaginary flat surface. A sagittal section is when you make a cut along that imaginary surface. So, a section is a cut or even the process of cutting. It could be a verb, like I'm going to section this kidney. And we have to kind of straighten that out, those physical concepts and that word par tomo is a good one to spend a minute or two on because that refers to a cutting or a sectioning of something. And that's embedded in some of our medical terminology, isn't it, especially related to imaging. And that's something we're going to talk about in just a moment here.

Kevin Patton (00:41:58):

That's one aspect. Another aspect that I think that we need to do right at the beginning is apply some of the concepts of what do things look like when we section a body or body part along a plane. In other words, if we have a tube, what does it look like when we cut it on a section and which kind of section? So, if we cut it on a cross section, it's going to look like a circle. We cut it on a longitudinal section and it might look like a set of parallel lines, but of course, many of the tubes in the body, they zigzag back and forth. And so, what we're going to see is a zigzag when we cut it on that longitudinal section. It's going to go up and down and up and down. And if we do that early on, then when we get to histology and we see some tissues that are cut that way, like lining of the intestines and so on, then students aren't going to be as confused by that. They're going to hopefully be able to match that up with what they know about tubes and how they're sectioned.

Kevin Patton (00:43:02):

And what does a cavity look like when it is sectioned? What does a muscle look like when it's sliced or sectioned on a plane? What do these hollow organs look like, like the stomach when they're cut on a section? So, the applied part of it is something that I think we need to make sure our

students know before they go any further. Do what we can to make sure they know it, comfortable with it.

Kevin Patton (00:43:26):

Now, they're not going to be completely comfortable with it, because that's going to be developed over the A&P course and will be even more fine-tuned when they get to later courses. So, I mean, they're not going to know it absolutely, but I think they need to know it better than sometimes we're allowing for at the beginning of our course.

Kevin Patton (00:43:44):

And then, the next thing I think we need to spend a few minutes on is the medical technology involved in sections. I mean, the original technology of cutting in sections that give us the word anatomy with that tomo word part right in the middle of it we can make sections by actually cutting the body or a part of the body, maybe even an individual organ and we can make sections that way. So, okay. Pretty low technology. You need a knife, maybe a saw and that's about it and you can make a section, but we now know that there's all kinds of other technology that we have available. We also have a lot of medical technologies such as CT scans, PET scans, and we can make those kinds of views of the body that are actual views of the body without having to actually cut the body. So, wow. What a great medical breakthrough that is, but it's also good for teaching anatomy, that we can dissect virtually using these technologies. But we just assume that students know what a CT scan is. We assume that they know what a PET scan is. I mean, if you're going to build a CT machine, that's difficult. Yeah. Okay. It's complex technology, but the idea of it is pretty simple and that's all we need our students to know about is idea of it.

Kevin Patton (00:45:13):

And there's lots of resources for helping students with that. And maybe some practical things, too, like when you see a medical image, try to orient yourself the same way we do to the illustrations. Where's anatomical left and right? Where's superior/inferior? What section are we looking at? Are we looking at a horizontal section? Are we looking at a frontal section? We

looking at a midsagittal or a sagittal section? What kind of section are we looking at here? And also, what's our perspective? A lot of medical images, if we're looking at a horizontal or transverse section in a CT scan, we're usually looking at it from an inferior perspective. It's not always true, but it's often true.

Kevin Patton (00:46:01):

So, that'll help us orient to where things are and figure out left versus right and so on. And what are the landmarks we look for? And on medical images, it's usually pretty easy. The landmarks we look for. That little L over there or that little R over on the other side, sometimes it's spelled out left and right. But sometimes you don't see those. And, of course, in other kinds of images like from the Visible Human Project and other kinds of actual cut body donors aren't necessarily going to be labeled that way. And so, we're going to have to look at the organs inside the body to try and figure out left and right.

Kevin Patton (00:46:37):

So, why are we doing this? Why are we paying attention to sectional anatomy? Well, I think it stretches students to a higher cognitive level pretty painlessly, and actually in a kind of a fun and interesting way for the students. It strengthens their conceptual framework when they can understand human structure from different perspectives, from different angles of view instead of just that one section that is traditionally in that chapter of the book that shows the kidney, the frontal section of the kidney. Let's look at some other sections of the kidney. Let's look at the kidney in the context of the entire abdominal pelvic area, although it's retroperitoneal. So, let's look at that aspect of it.

Kevin Patton (00:47:29):

Yeah. Okay. So, we have these things connecting with each other and isn't that what we want to do in our course is not just have them walk out with an isolated set of facts, but having had the practice of connecting those facts and they don't have to have all the facts and they don't have to be able to connect all the facts by the time they walk out of our course. What

we're doing is setting up the basics so that they can fill in those blanks. They have the conceptual tools and the conceptual practice of having done that, so that when they see something they've not encountered before, or they simply just don't remember from their A&P class, they're going to be able to fill that in accurately and effectively. They're going to know how to do that, how to approach that. And by asking them to make these connections with sectional anatomy examples, that gives them that practice and that confidence to be able to do that.

Kevin Patton (00:48:27):

And I think that when we start looking at it that way and start bringing in some sectional anatomy activities or examples for students to look at, that introduces some additional activity to the learning, that active learning component that we like to add into what we're doing in the classroom and what students are doing. So, if we're learning structures, we don't want to just watch the tour. That's not only boring and disengages students from wanting to learn anything else, but it's not active, it's passive. And we can't really learn much that way.

Kevin Patton (00:49:05):

So, this if we ask students to, "Well, okay, so here's how the kidneys built and so on. Now, here's a slice through the abdominal area of the body. And can you find the kidneys in there? How do you know that's a kidney? How do you know this one's a kidney?" Or maybe do an image with a frontal section where it's a little more obvious where the kidneys are at least more obvious to a beginner. It's one of the many ways we have to introduce that active component to learning and expand on the passive parts, to build on those passive parts.

Kevin Patton (00:49:41):

Now, there's a basic strategy of using sectional anatomy is to identify structures in different sections right after learning about them. So, in other words, okay, we learn about the general structure, gross structure of the kidney. Now let's look at some medical images, let's look at some CT scans,

some PET scans. That glowing part over there, is that part of the kidney or not part of the kidney? Which part of the kidney is it?

Kevin Patton (00:50:08):

And so they're not going to be very competent at that point, because they've just been introduced to the kidney. So, assuming very little knowledge that they've walked into your course with, then they're not going to be able to interpret all these medical images just like that. They're going to have to struggle with it, but it's the kind of struggle that you do when you're solving a puzzle, when you're solving a riddle or solving a mystery.

Kevin Patton (00:50:34):

So, when you're doing that, then you're going through a learning process. You're having a little bit of fruitful frustration in applying things. So, you're stretching yourself and you're starting to make connections with other things that you've learned because, I don't know. A lot of people tell the story of the human body, where the kidney comes a little bit after the part of the story where we talk about the liver and talk about the pancreas and talk about the abdominal wall. That usually comes pretty early in the course.

Kevin Patton (00:51:08):

So, they're going to be able to take those things they've already learned and add those in. And, oh, man, to me, is somewhat amusing and not at all unexpected when our students, they, oh, they compartmentalize things so much. And so, when they leave a topic, "Okay, we're done with the liver. I'm not going to think about the liver ever again." No, no, no. We can't do that. Like, "Oh, my gosh! Now I have to think about the liver and where it is. The layers of the abdominal wall, those muscles in the abdominal wall. I thought we were done with that last semester." Nope, nope, nope. We're coming back to it and we're seeing it in this image here.

Kevin Patton (00:51:47):

And so, not only looking at whatever organ or system that they just learned, but then spending a little bit time expanding that and looking at that context and bringing in those things that they've already learned and maybe even previewing some things that they're yet to learn like, oh, I think that there's a bladder. That might be the prostate under the bladder. We haven't gotten to that yet, but I think that might be what's going on here.

Kevin Patton (00:52:15):

And I think that there's all kinds of ways that this is going to shake up the minds of our students in a way where they're not just passively receiving this stuff and moving on from there. They're actually being asked to apply it. And I think there are a lot of times it's very easy for us to think of ways to make those applications for physiological principles, but for anatomy, not so much, we kind of just like, oh, anatomy's just these parts and yeah, okay, there's some higher level thinking when we're thinking about the patterns that we see, maybe embryologic patterns or other kinds of patterns, functional patterns that we see in the anatomy of the body.

Kevin Patton (00:53:00):

But here's another way. Here's another tool to add to our toolbox to get students applying things and getting to higher cognitive levels and doing it in a fun way. Because, like I said, if this is a puzzle or mystery that they're solving, and especially if you let them do a collaborative, either in pairs or in small groups or whatever, and they don't always have to take a lot of time and just spend a few minutes. Can you tell where the kidneys are? And they might even start debating one another and getting a little competitive about it, like, "Oh, we found it first," and so on. And that's the good kind of mixing it up. I think that helps with learning.

Finding Media

Kevin Patton (00:53:45):

Hey, let's step back for just a moment. As we discuss applying anatomy concepts and helping students build their conceptual frameworks by exploring sectional anatomy, it probably occurs to you, where do we get sectional anatomy images to use in our course? That's a problem. Yeah. There are a few available in our A&P textbooks and associated printed and digital resources, right? Yeah, but only a few. And we need a lot of them if we're going to do what I'm suggesting.

Kevin Patton (00:54:26):

One option is to explore the teaching resources from the American Association for Anatomy at anatomy.org. I had mentioned that earlier in this episode. Another place to go is my own collection of sources for teaching media in anatomy and physiology. You can find that at theAPprofessor.org/media. Once again, theAPprofessor.org/media. By the way, I encourage you, I beg you to send me your suggestions for that media list, so that it's an even better resource. Okay. Let's step forward again and we'll jump back into our discussion of sectional anatomy.

More Sectional Anatomy

Kevin Patton (00:55:19):

There are different ways that you can present the sectional anatomy. You can start with simple diagrams that really make it very easy to solve the puzzle, and then maybe move into more realistic or complex illustrations where, oh, there's a lot more going on here that I have to kind of eat around the weeds here and find what it is I'm really looking for. Where is that kidney? It was easy in the stick diagram, but now not so much. And so, that's a little bit higher level of competence and then maybe get a

photograph of a body donor slice as from the Visible Human Project and other resources, and then move from there into medical images, like a CT scan or PET scan. And so, there are different levels of interpretation that are going to stretch the students more and more. And so, we can figure out a good recipe of how to handle that in our course.

Kevin Patton (00:56:17):

Something I do a lot and I really love, and I've mentioned this in previous episodes and that is use mini case studies. And some of those, I use all kinds of different mini case studies. And when I call them mini case studies, what I mean is they're not the more involved case studies that you might see from the Case Study Center for Science or from the LifeSciTRC repository of case studies and so on where there may be several steps and maybe some complexity involved. I'm talking about one or two sentences, or maybe even just a picture. Here's an X-ray. Can you point out where the femur is or how many bones can you identify in this X-ray? Clinical cases that they work out, those are fine, but they can be just very simple, pared-down stories. Just one piece of that more complex clinical case I like to use as a test item and for my formative tests. And even my summative tests, my evaluative assessments.

Kevin Patton (00:57:20):

So, there's that. And clinical cases are fine, clinical applications, but there's all kinds of other applications we can make, too. I mean, don't forget that there's athletic applications. You might be able to look at an X-ray and tell whether this pitcher is left-handed or right-handed. How could you tell? What would you look for? What are the organs involved, the structures involved?

Kevin Patton (00:57:46):

So, there's athletic applications, there's forensic applications. That's always fascinating to students and there's archeological applications like, "Okay, we found these remains from a thousand years ago. And so, which ones are most likely to have been the ones to throw the harpoon out of the kayak and which are the ones that are more likely to have been paddling the

kayak and how would we tell that from this X-ray?" And we can get ... Nowadays, they're X-raying mummified human remains and intentionally mummified and those that were mummified by nature.

Kevin Patton (00:58:28):

And so, lots of different kinds of applications, so we can expand our repertoire that way, too. And I like to mix it up occasionally with an animal comparison. Try to get a medical image, or maybe an actual slice of an animal body and try to get them, especially mammals, but other organisms as well and try to see if they can identify which one's the femur, which one's the humerus, not just the bones, but different muscles and liver and organ. And, I mean, there's some big differences and there are some really close similarities among the different mammals. And so, this is a good opportunity to kind of push them a little bit and see if they can get the Final Jeopardy! answer. It's usually a little harder than those in the first round of Jeopardy!.

Kevin Patton (00:59:28):

Another thing that I like to do is use paper images, do those in pairs and groups, where I'll print out a page for them. And our copy center will do this, print them out on 11 by 17, where they're nice and big, so that a few people, two, three, four people can sit around the same image and start to mark it up. And I always recommend that they use erasable color pencils to do this and start tell them, "Okay, I need you to label the kidney. Okay, you got the kidney. What other things can you identify in this image?" And then I usually give them each a copy, but let them work in groups so they can look at each others and so on. So, they can all walk out, each individual can walk out of there with a paper that's been marked up and they can use that in their studying and maybe go even further with it in their study group. Or you can give it as a takeaway assignment as well.

Kevin Patton (01:00:26):

Another thing that you can do and that I've done is have open online activities where I do any of those things, little mini cases, and do images where they identify different parts of their medical image or dissection

image that's been sectioned and do sectional anatomy that way. And they can be part of an online formative test. That's mainly the way I do it and can have quick identifications if you're in class and you have the group altogether, and you're doing a lecture or discussion session. Then, you can use a clicker or some other kind of student response device and put up an image and say, "Which one of these, A, B, C, D, or E or whatever is the kidney," or whatever it is that you're looking for.

Kevin Patton (01:01:14):

Maybe, depending on the kind of responses we have, if they can type in an answer, say, "Okay. The arrow is pointing to which organ," and have them type in, "That's the liver," or, "That's the spleen," or whatever. And again, whatever it is you're looking for. So, those are really quick identifications, just to kind of break things up a little bit and then move on. And there might be an opportunity there that you might find a misconception by doing that. And then you can take the time to say, "Oh, everybody went this direction and really it's the other thing. So, why are you thinking this is the right answer?" And then you can clear up some of those misconceptions. And students can even start making their own flashcards, or you could provide images for them to make their own flashcards where they can start identifying things in a section. Of course, that would need to come later.

Kevin Patton (01:02:05):

And I'm not saying that they need to memorize these things. So, I'm having flashcards being just like little mini cases, little mini mysteries that they work out, but that would be another way of doing it. If we're not intentionally adding in those sectional anatomy examples, then students aren't going to learn it that way.

Kevin Patton (01:02:29):

Another thing that I want to mention very briefly is some people really, really, really struggle with spatial relationships and connecting different spatial views of human structures. And this gets back to a principle I just mentioned a little while ago. I sometimes call it Kevin's all purpose, gluten-free principles of teaching number two. This is principle number two. Every

person is unique. Now you may wonder what principle number one is. Principle number one is be kind. And that works here, too. We need to be kind when we realize that every person is unique in our course. And some people just really, really struggle with these spacial relationships. They don't think like I do, like I was just saying a few minutes ago. So, some of those folks, they need extra help with spacial relationships and I think mostly just encouraging them and supporting them and giving them extra time to work on that and answering their questions. And maybe even walking through it with them in a kind and supportive way is going to help them. With little kids that are having problems with spatial relationships, that's what they do. They just start playing around with stuff and having people there to help them navigate these things.

Kevin Patton (01:03:52):

Another strategy, I guess, that we could use is dissection. I mean, don't we do that? A lot of these spacial relationships we learn when we do dissection. So, you could use dissection with a student who's having trouble with spatial relationships and have the dissection going on alongside these sectional representations, such as medical images or body donors that have been sectioned in certain ways.

Kevin Patton (01:04:19):

If you have a body donor available, or you have an animal dissection specimen you can use for that, or if you have a synthetic body you can use, or a plastic model, that can help a lot with spatial relationships, but just a lot of practice. And literally playing around with that stuff is usually a good strategy for helping folks develop their spatial relationships if they're having trouble with that.

Kevin Patton (01:04:45):

Some other things that they can do to play around, you can use transparency overlays, like some textbooks will have those transparency overlays where you can peel away layer after layer. That may help with spatial relationships. Building clay models and related activities, where you're building things, doing crafts-type things. I did for a while with my

students this little thing, which I called my gingerbread person activity, where we took a gingerbread mold and used clear, unflavored gelatin and put in some different things like, oh, different kinds of pasta, like the heli-tube, couple different kinds of those hollow kinds of pasta.

Kevin Patton (01:05:29):

And then the spaghetti or vermicelli pasta in there, and maybe a couple jelly beans and different kinds or some Peanut M&M's, and put them in there and let the gel harden and then do some slices at different planes and see, well, how does that hollow tuba of pasta look when we slice it this way? What does it look like when we slice it that way? And if we've curled one up like an intestine, we can see what that looks like when we slice through it.

Kevin Patton (01:06:00):

And if I can find the data, I presented that at a conference many, many moons ago, decades ago, and I'm going to try and find that. And if I find it I'll post it in the TAPP app. That's the free app you can get in your device's app store. Just look up the A&P Professor and download that app.

Kevin Patton (01:06:22):

You can listen to the episodes through the app, but that's where I also put the bonus handouts and materials and so on, so I'll put it there if I can find it.

Kevin Patton (01:06:31):

And then, also remember that some students that are having trouble with spatial relationships, they might have a serious issue. And you might want to nudge them to see if they can find some outside therapy to help them with that. And you'd be surprised at how much therapy can be done and how effective it can be with some of these atypical cognitive issues, such as spatial relationships. So, that's more than you want to know about my perspective of what we can do with sexual anatomy in the A&P course.

Staying Connected

Kevin Patton (01:07:12):

In this episode, Terry Thompson joined the conversation about deadline terminology by sharing her use of the term expiration date for tests and assignments. And Terry also gave us a thoughtful review of a new book club recommendation, I Contain Multitudes: The Microbes Within Us and a Grander View of Life by Ed Yong. I reviewed a few slide tricks to make our presentations work better for learning and for professional presentations. And I talked about why our A&P students need to experience sexual anatomy and get comfortable with it by playing around with it in various ways.

Kevin Patton (01:07:55):

There's something in there that you want to share with a colleague, right? Probably more than one thing. There's an easy way to share this episode. Simply go to theAPprofessor.org/refer to get a personalized share link that will get your friend or department or discussion group all set up. I always, always, always provide links if you want to know more about anything we discuss here. It'll break my heart if I did all that work and you don't use them. If you don't see my links in your podcast player, just go to the show notes at the episode page at theAPprofessor.org/116. And while you're there, you can claim your digital credential for listening to this episode so that you can document this professional development experience for your CV or your professional development plan or your promotion packet, or I don't know. You can sew your badges on the sash that you wear at ceremonial occasions.

Kevin Patton (01:09:06):

And don't forget. Be like Jerry and be like Terry and all those many others. And take the plunge by calling in with your questions, comments, and ideas at the podcast hotline. That's 1-833-LION-DEN, or 1-833-546-6336, or send a recording, a written message to podcast@theAPprofessor.org. You're

invited to join my private online A&P teaching community at theAPprofessor.org/community. I'll see you down the road.

Aileen (01:09:49):

The A&P Professor is hosted by Dr. Kevin Patton, an award-winning professor and textbook author in human anatomy and physiology.

Kevin Patton (01:10:03):

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