Bringing Anatomy and Physiology to Life The Process and Product Continuum

By Earle Abrahamson and Jane Langston

s student therapists learning anatomy for the first time, we vividly recall the hours spent in the library reading through

texts and trying to summarise what the authors were saying. The text did not always make sense and we found ourselves trying to cram knowledge into the cortex of our brain without fully understanding it, and we were lost. Does this sound familiar? Did you feel that writing notes and rewriting passages from prescribed texts was your only option for learning?

In practice, we see entry level therapists confused when questioned on the detailed anatomy of a patient. For many students, anatomy was a module they needed to pass to satisfy the practice requirements. Anatomy was a separate entity from the practice framework. What specific methods could be used to remind students of the important learning objectives? And how much safer would massage practice be, if there were greater understanding of anatomical fundamentals?

In our first article, we discussed how to learn anatomy by considering the teaching methods, journeys, and experiences of both the student and teacher. In this article, we extend the journey by asking how does one enliven anatomy, and bring it to life. What can educators do to ensure that learning is active and applied? How do therapists learn? And how do we lay the foundations to encourage lifelong learning?

Laying the foundations

The art of learning anatomy and physiology can be likened to the process of building a house. How solid is the ground on which we are building? How deep should the foundations be? How many layers of bricks should we build for the room to be tall enough for our use? Just as the architect and the engineer work with the builder to construct detailed plans that must be followed so that a structure that resembles the initial design sketched by the architect is built, so must the anatomy and physiology course follow carefully thought-out plans. The foundations of knowledge must be built on solid ground and be sufficient to withstand and support the correct lavers of knowledge. Just as the house has all its services of electricity, gas, water and sewerage, in addition to its bricks and mortar, so must the anatomy and physiology course have all the required body systems in place, such as the nervous, respiratory, lymphatic, renal, digestive and musculoskeletal systems. (Fig.1)



Figure 1: The systems of the body can be compared to those of a house.

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Each building that is constructed is handed over to its future occupants with a technical manual explaining the hardware of the building. This can be likened to the study of anatomy, with its intricate detail of how each organ or tissue is constructed. Occupants are also given an operations manual, explaining what to do when things go wrong. This is analogous to the study of physiology and pathology, with their explanations of how the body works and what happens when it goes wrong. And just as an apprentice in the building trade chooses a specialism to become a plumber, electrician, bricklayer or carpenter, anatomy and physiology students will go on to use the information learned on their course to become massage therapists, sports therapists or other similar professions.

Can you speak 'anatomy'?

Let me tell you a story. My builder rang me to give me an update on delivery dates for some materials for the extension he was building for me. After only ten seconds, it dawned on me that I simply didn't speak 'building'. What on earth was a lintel? Something to boil up and turn into soup? Soffits? What were soffits? A new brand of fabric conditioner? And what was Celotex? Surely we didn't need any explosives to make our living room larger?

By the time I had unpicked the language my builder rattled off to me in his broad Suffolk accent, I realised I actually couldn't remember a single thing he had said as all of these items had names that were completely foreign to me. This is exactly what a new anatomy student may encounter when confronted with terms such as 'Greater Trochanter'. Is that a village in Scotland? And as for Islets of Langerhans, surely they are a holiday destination in the West Indies! Tell them the greater trochanter is the big knobbly bit found at the top of the leg, and they will absolutely understand what and where it is, and can expand their knowledge by thinking about its attached muscles. And explain that the Islets of Langerhans are the insulinproducing cells of the pancreas that don't work properly in diabetes, and things begin to make sense. Likewise, my builder had to tell me he was ordering the concrete bits for the tops of my windows and the white boards that are behind my gutters, and that he would be buying packs of insulation to put between the roof beams. If he had said that in the first place, we would have had a much shorter conversation, and I would have been able to visualise the items in the delivery van.

Speak 'anatomy'? It's all greek to me!

Yes, many anatomical words do indeed stem from Greek or Latin roots, and knowing the prefixes and suffixes and their associations will help you understand the journey through anatomy, physiology and pathology. Finding links between these terms and everyday items and events will make the meaning stick in your memory. These learning points are best created by yourselves, rather than just borrowing other people's ideas. Your own imagination will be the one that creates the best memories for you.

Some examples of learning points created for anatomical terms are listed in the table below.

Use starter-level books for beginners to anatomy and physiology rather than heavy duty tomes that go into too much detail too soon in the learning process. Just as a language is learned gradually, through conversation and the written word, so anatomy and physiology become familiar and friendlier as the correct terms are used appropriately. This isn't dumbing down, it is simply setting a clear pathway to learning.

I spy anatomy!

Look for anatomical references everywhere you go and in everything you do! Become passionate about your subject, and bring it into your daily life!

How can you do this?

Look for shapes that recur within anatomy and nature. The feather shape of the quadriceps muscles, the similarity between the eye and a slice of carrot, and the definite shape of a ram's head when looking at the uterus and ovaries. Food is a great source of memorable visual aids. We have produced 'Veggie Man' posters which we sell via our website and at events, to demonstrate the recurrence of shape within nature, and the overall image is memorable, fun, and a great work of art! (See main image)

Try it yourself. Look at how a walnut appears to replicate the shape of the brain. Note how kidney beans truly have the shape of a kidney. And look at how bunches of grapes appear to take the shape of alveoli.

And now enliven your visual learning by

creating collages of structures. Go on! Have fun! (Fig.2)

Play the game

Have you ever acted out anatomical structures or physiological processes? Either alone or in a group? Worth a go to build a memory!

War on bugs

Role play can be used for many structures and



Figure 2: Skin cross-section collage

processes within the body. A great example is to show how the immune response acts to destroy a particular pathogen. Each student is given a specific role in the immune system (antibody, helper T cell, cytotoxic T cell, B cell, complement etc.). Discuss as a group how each is involved in the ultimate destruction of the pathogen, then act out the

ANATOMICAL TERM	WHAT IT MEANS	LEARNING POINT
Anterior/ventral	Front of body	Associate ant with terrier as a front line
Posterior/dorsal	Back of body	Think of the buttocks as a post box
Superior	Towards the head	People who think they are superior have big heads
Inferior	Towards the feet	People who think they are inferior look down on themselves
Proximal	Towards the origin/point of attachment of a structure, or the median line of the body	Consider that pros are on top of their game
Distal	Away from the origin/point of attachment of a structure, or the median line of the body	Distal is some <i>dista</i> nce away
Abduct	Move away from the midline	Someone who has been abducted has been taken away
Adduct	Towards the midline	Double <i>dd</i> in the word to suggest 'down down', or <i>add</i> ed to the body
Flexion	Reduce angle of a joint	To flex means to bend
Extend	Increase angle of a joint	When we extend, we increase the area

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'war on bugs'. Building a storyboard records the process. Fun to do, and you will find that you remember WHO played the bug, WHO played complement, and WHO was the most cytotoxic T cell. The interlinks between the identities of fellow classmates hamming it up, and the physiological processes will be remembered for life!

Who am I?

This is an old parlour guessing game. Students take it in turns to guess the identity of a disease, anatomical structure or physiological process by asking questions that require a 'yes' or 'no' answer. The class can use text books to research the answers, so active learning occurs.

Go it alone...

If you are learning alone, then create flashcards, and play 'Happy Families' or memory games. Draw and label pictures. Use your body as a resource and locate structures in your own body. Draw them on. Grab a willing friend and draw on them! No need to undress, as you can draw on an old t-shirt or leggings too. Palpating and locating structures combines art and anatomy. (Fig.3)

If you prefer words to drawings, then make up some poems, mnemonics, songs or jokes to help you. We have resourced some in our book, Making Sense of Learning Human Anatomy and Physiology, but the best ones for you will be the ones that you create yourself - the sillier (and often ruder!) the better. Get inventing!

Skeleton staff

Enlist the help of 'skeleton staff' when learning anatomical structures, particularly bony landmarks and muscle attachments. Borrow or purchase model skeletons. whether its full sized or a more reasonably priced toy version. Online auctions are good places to buy

models of body parts and bony structures. You can label these with stickers, and keep them near you when you work or study, to remind you of the landmarks and features.

Masking tape can be used to mark out the locations and attachments of muscles. Open book learning will reinforce your memory of them; look up the origins and insertions, then locate them on the model. Choose different coloured masking tape to add to the visual experience. (Fig.4)

Watch and Learn...

Many textbooks have related websites and DVDs to accompany the course. Don't ignore them, use them! Do watch television programmes about health, disease and anatomy. Even programmes such as 'Casualty' or 'GPs Behind Closed Doors' can pique your interest in anatomical matters, and you can test yourself to see if you work out the disease before 'Dr. House'.

Figure 3: Immaculate Dissection courses combine anatomy, palpation and art





Figure 4: Boris Bones shows off his pectoralis minor

YouTube also offers a massive selection of anatomical videos. Just make sure that you don't get distracted and watch videos of cats talking or babies sneezing! The LearnAnatomy team take requests, so if you want us to do a short video for you, let us know.

For us, the important dynamic of learning is the engagement of the learner with the learning content. To support this, many varied resources can be used to reinforce learning concepts and better direct the learner and teacher towards the learning product and objectives. Analogies, metaphors, active learning, art and games are all used to enliven the learning of anatomy, and make it memorable by using all our senses and learning styles.

Benjamin Franklin best summarised this approach to learning when he wrote:

'Tell me and I forget. Teach me and I remember. Involve me and I learn.'



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Jane Langston is co-author of Making Sense of Learning Human Anatomy and Physiology (Lotus Publishing). She remains a Fellow of the Institute of Biomedical Science, and worked in pathology departments in the National Health Service in England for over 20 years. This instilled in her a love of anatomy and physiology. She has been an Amatsu practitioner since 2000, and is now managing director of the multi-award winning company, The Amatsu Training School. In 2012, this was awarded the ICNM Best Complementary Medicine Company, and in 2015, Jane was given the

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Further information on Anatomy and Physiology courses can be found here: www.learnantomy.uk Further information on training courses can be found here: www.hands-on-training.co.uk | www.massagetraining.co.uk | www.amatsutrainingschool.com