

# Beyond Barriers Learning to Navigate Obstacles in Anatomical Study

By Earle Abrahamson and Jane Langston

**A**natomy is often seen as a complex study, one that requires careful organisation of study material to ensure that students not only successfully navigate the examination, but more importantly retain the information they learn. Often students fail to retain the information they need, and rely on rote learning to answer examination questions. The more they study the less they appear to learn. This typifies a set learning strategy wherein students attempt to cram information prior to taking examinations. Imagine a vessel that is full and yet one tries to fill it even further. The result is an overflow and loss of content. How should one learn anatomy and what strategies are available to overcome obstacles and troublesome learning content?

Learning and teaching is a two-way street. A student learns, and a tutor teaches; and an inspiring teacher will encourage a keen student by giving the tools for self-directed learning. Likewise, students will regularly test the tutors' knowledge. Who is teaching and who is learning? The answer is both! What happens though, when concepts become hard to learn? How can we improve our anatomical knowledge if we are stuck on a body system or physiological process?

Have you ever travelled to a foreign land or place? What were your feelings, expectations, frustrations, highlights and disappointments? What happened when you arrived in a place that you had not previously been to, where the culture and customs are distinctly

different to what you are used to, where language is a barrier not an enabler, where being different has huge implications for success and failure? The study of anatomy and physiology has the potential to be this place, often alien and isolating, using language that is different and processes that seem strange and obscure. This article aims to help us to learn to make sense of perceived alien concepts and terms, and create strategies in our teaching and learning to overcome these hurdles.

In teaching anatomy and physiology, there is a natural assumption that learners will pick up on the main themes and foundation topics, and fill in the gaps themselves. By its nature, teaching the anatomical systems means that the interlinking and interrelationships of the systems is not able to be addressed until after full understanding at a basic level is reached. Crucial learning steps are omitted as the teacher assumes that the knowledge is already known by the student, e.g. it may be necessary to explain anatomical terms such as medial or lateral before expecting students to understand muscular attachments to medial and lateral bone borders. Think about the instructions you give and whether they are readily understood. Students may need to find missing pieces before they can learn to navigate difficult concepts.

The goal of teaching is to show students how to find answers to troublesome learning content and move through a bottleneck situation. Pace (2015) describes the concepts

of bottlenecks in decoding subject matter as an obstructed passage; one which may be difficult to bypass or navigate. A difficult topic seems to jam up the system in the learner's thought processes, so nothing else can be learned until the obstruction is cleared by deep understanding of the subject. Try as you might, you will be unable to move forwards with your understanding until the basic problem is addressed. Students may then get lost in the sea of anatomy, and feel the content and themes of the human body simply washing over them, without being able to absorb and enjoy the content sufficiently.

Some anatomical concepts are foundations upon which the rest of anatomical knowledge is built. In these cases, if the concepts are not fully understood, the foundations are shaky and unable to support the vast amounts of detail piled on top. Our need to compartmentalise anatomy into the body systems means that learners do not fully appreciate the interrelationships between the organs and systems in terms of both structure and function. Below is a list of anatomical content that often causes confusion and may lead to bottlenecks in learning:

- **Nomenclature takes time to learn, digest and process**

- Anatomical terms and concepts
- Proximal/distal
- Supination/pronation
- Anterior/posterior
- Planes and axes of motion

- **Three dimensionality and relating that to the two dimensions drawn in books**

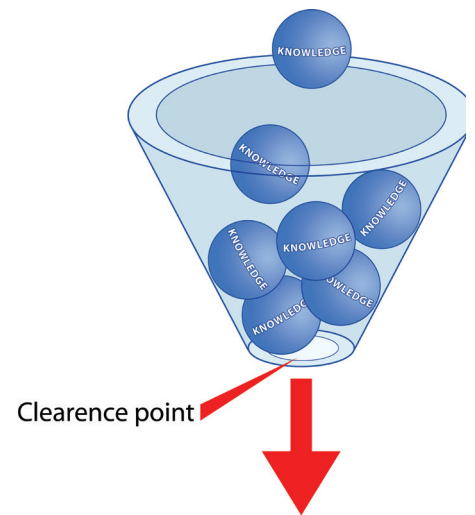
- Position of muscles (which is in front and which is beside or behind)
- Size and position of organs (lungs are thought to completely fill the ribs, kidneys are thought to be far too low)
- Position of the spinal cord within the spine itself (some students are shocked that the spinal cord does not run through the centre of the discs!)
- Size of nephron (do not appreciate that this is a microscopic structure)
- Length and size of nerves and spinal cord

- **Fundamentals**

- Blood flow through the heart and body (think that blood zips all the way around the body in one heart beat – also that it follows a set path so the red cells are all in a line chugging their way through the same pathway in and out of the lung, then each limb, and eventually to the kidney and back to the heart)
- Lymphatics as a fluid system (confusion with the nomenclature of the fluids – tissue fluid, interstitial fluid, lymph, plasma, filtrate)
- Autonomic nervous system (PNS and SNS) going to each body system (do both PNS and SNS go to each organ? Why?)
- Action and shape of the diaphragm (the overall shape of the diaphragm is hard to visualise as most diagrams show it from the front, and only half of it, so no appreciation of joining to the ribs, and the dome shaped aponeurosis, or the thickness of the actual belly of the muscle. Students often think the TENDON of the diaphragm contracts and pulls the dome down, like a bell rope)
- Articular and hyaline cartilage? (Are they totally different and relate to differing parts of the body?)
- Embryology and growth (no concept of this, as the fundamentals of fully grown tissue is not fully embedded)

## Bottlenecks

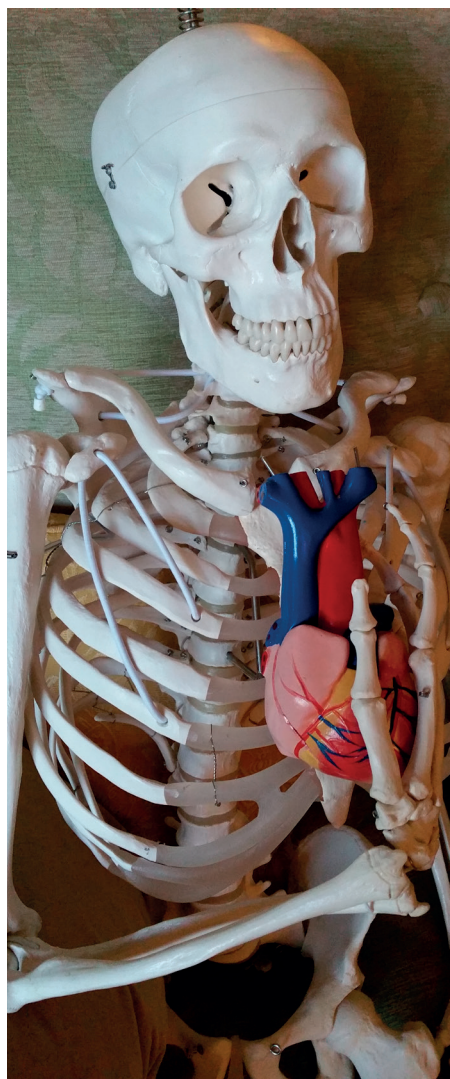
Bottleneck situations could be emotional. Worrying about upcoming anatomy examinations is a prime example of this. Emotional bottlenecks such as increased anxiety can be created through avoidance strategies, lack of knowledge and inability to learn content. These bottlenecks, if not effectively managed, can further lead to heightened feelings of failure and inability to succeed.



I recall one of my first learning experiences in my first year of anatomy. I was studying medical anatomy, learning the art of dissection. My lecturer was an experienced academic who took pride in instilling a sense of fear in his students, focusing on failure not success. I was scared to ask questions and simply nodded to indicate I understood, even if I did not, and prayed I would never be asked to evidence my knowledge, or lack thereof, in front of my classmates. My prayers were not answered and I was asked to describe and explain the muscle action of the upper limb in response to a handshake. I recall freezing almost like a deer in the headlights, and searched through the filing cabinets of my mind to produce some sort of educated response. My fear was palpable, with colleagues looking at me and almost acknowledging that this was how they felt as well. I now can appreciate that physiologically my autonomic nervous system was in overdrive, with my sympathetic nerves and parasympathetic nerves turned on full blast to create a frozen moment. I managed to stammer out a few muscle names and was asked to sit down. I realised that for my lecturer the joy was in watching me struggle. After my struggle and search for an answer, he lost interest and was not at all concerned with what I said. This lonely journey of searching for an answer can, at times, be troublesome, especially if the knowledge we have has no significance to the answer we need to produce. How best do we overcome these fears, navigate confusion and work towards success? In considering answers to these difficult questions, research has identified a number of useful strategies:



- Identify potential bottlenecks in advance (tutors)
- Be aware of potential bottlenecks in advance (learners)
- Define the basic learning tasks
- Start with the big concepts and hang the detail on afterwards
- Learn things in a stepwise manner, starting with the basics and building on fundamentals
- Give and receive feedback and act on it
- Motivation - focus on what is right and build confidence in learning
- Assess regularly and keep a “bug book” for reflection and reflective diary. A bug book is a personal diary that enables the learner to note any difficult, alien, or new terms. The student then learns these bug words, and eventually learns to move bugs into butterflies and dispel fears within learning.
- Celebrate success
- Share understanding with study buddies or fellow teachers
- Planning and diary management
- Good nutrition and sleep



Anatomy and physiology are lived experiences. The key to success is learning to overcome hurdles and navigating problematic content, not necessarily avoiding it. Mastery of content comes with an ability to appreciate the learning, and deconstruct complex information into smaller working components. Learning anatomy is about embracing and realising the power of change in both knowledge and individual development. The LearnAnatomy workshops and refresher courses endeavour to tackle these difficult concepts and give foundation on which to build a solid framework of anatomical learning.

Remember that a bend in the road is not the end of the road unless we fail to make the turn. Learning to achieve, is learning how to turn obstacles into opportunities.

## References

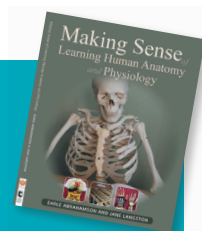
Pace, D. (2015). *Decoding the Discipline Workshop*. EuroSoTL, Cork, Ireland, 8-9 July 2015.



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Further information on Anatomy and Physiology courses can be found here: [www.learnanatomy.uk](http://www.learnanatomy.uk)

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