

Editorial: Learning Anatomy - A pain in the neck?

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Background

Anatomy education is making a comeback. Since the curriculum reviews of the 1990s where the time dedicated to learning anatomy was considerably reduced (1-3) and demonstrator posts were in decline (4), significant gaps were frequently seen in individuals' knowledge. This has been described by some as anatomy deficit disorder (ADD) (5). The past few years have seen renewed enthusiasm and verification of its importance, succinctly summarised as "anatomy may be falling but it's not supine yet!" (6).

The recorded rise in litigation linked to a deficit of anatomical knowledge (7, 8) has made curriculum planners and regulatory bodies think again. In 2007, the Anatomical Society produced a core curriculum for medical students (9) and this has been included in the recent 2009 Teaching Tomorrows Doctors. An entire journal (Anatomical Sciences Education) has emerged dedicated to anatomy pedagogy. Joint meetings to show support for anatomy such as the Royal College of Surgeons 'Anatomy the cruellest cut of all' (2007) have been held. Most recently a Joint Education conference was held in 2011 between the Anatomical Society, British Association of Anatomists and the Institute of Anatomical Sciences. The conference focused on the latest thinking in anatomy education, bringing together many colleagues from around the world. The UK is certainly leading the way in anatomy education.

Educational Research

Considerable research has provided an understanding of how students learn anatomy and perceive the learning task using various approaches (10). Recognised educational learning concepts can either be surface, deep or strategic (11) (Table 1). A recent study involving collaboration with different UK and European Medical and Dental Schools found that students who adopt a deep approach to

learning significantly perform better and are able to apply their knowledge in clinical practice (Figure 1) (12).

In contrast those students who have adopted a surface approach are statistically more likely to fail exams and enter a career where anatomy is not a strong feature (13, 14). Students who adopt a strategic approach are driven by assessments and will do whatever they perceive is needed to pass them - they naturally perform well but often struggle in later clinical years when knowledge reconstruction and application is required.

An interesting component is that threshold concepts (15) can be applied to anatomy (12), so a small amount of a surface approach is often required at an early stage, for example to learn terminology and basic anatomical detail. Touch Mediated Perception (how you learn through your fingers) is essential in the learning process since spatial ability is considered a key part in anatomical learning (16, 17). It is known that depth perception increases with training (18).

Head and neck anatomy can present its own unique challenges and is even considered to be a pain in the neck for students struggling to learn it! The head and neck is a complex area with many structures intimately related in a small area. Even with lots of bookwork and dissection/prosection, it can be difficult to see and understand that anatomy at operation.

As described above a key element to success in understanding anatomy is to take a deep approach, place the learning in context and to learn in a way that is active and involves Touch Mediated Perception both in the anatomy laboratory and in theatre for those students wishing to pursue a surgical career.

So how can the current anatomy curriculum improve? For undergraduates the ability to see and learn from practising surgeons (and others who have expertise in clinical anatomy such as neurologists and radiologists) would seem to be very important, as is the ability to relate what they learn on patients. For postgraduates it is the opportunity to revisit and improve their basic surgical

anatomy in relation to clinical practice, and for surgical trainees to learn in detail the various anatomical variations.

The Intercollegiate MRCS examination currently has 3 stations (out of 18) for the assessment of applied anatomy. Some members of the Court feel that the amount of anatomy being tested is too little, though others would argue that this examination is a test to demonstrate competence at the end of core training and that a detailed knowledge of anatomy at this stage is not required.

Surgical trainers expect a basic understanding of the anatomy of a region before any applied surgical anatomy can be learned in detail. The effect of disease (such as tumours/metastases in the neck) which potentially changes anatomical relationships needs to be understood. This experience can only be gained in theatre and by seeing and operating on as many cases as possible.

It is our view that without a basic knowledge of applied anatomy by the end of medical/dental school, clinical practice will suffer no matter what specialty one enters. For example many of the pains in the neck and facial region that we see can be explained anatomically, and those that can't can often be classified under the atypical category! Certainly as surgeons a detailed knowledge of the anatomy is a pre-requisite for safe practice. It is possible that the tide may change again in the near future by the regulatory bodies who control how much knowledge is required and at what level and standard it is assessed.

Conflict of interest: none

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Table 1. Key features of approaches to learning

Approach to Learning	Key features
Surface	Rote Memorisation Fear of failure No understanding Cannot retain and apply knowledge
Deep	Drive to understand concepts Relate to wider principles and clinical contexts Active learner Able to apply knowledge
Strategic	Driven by their perception of what is required for assessment May use elements of surface and deep approaches May have to re-learn concepts later on Limited ability to apply knowledge

FIGURE LEGEND

Figure 1. Year 2 undergraduate students engaging in learning the triangles of the neck.