

The participation of Anatomy Departments in the continuing professional development of surgeons

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SUMMARY

We have divided this article into five sections organised as follows. The first section expresses our views concerning the relevance of anatomy to the training of clinicians and surgeons. The second section analyses clinicians and surgeons perceptions about the relevance of anatomy for their training and is based upon the results of a questionnaire. The third section discusses whether surgeons or anatomists should be organising Continuing Professional Development (CPD) courses. The fourth section attempts to define the criteria for organising and developing surgical training courses. The fifth, and final, section outlines our experiences of planning and initiating surgical training courses.

1. ANATOMISTS VIEWS CONCERNING THE RELEVANCE OF ANATOMY

Anatomy seems to us to be one of the most fundamental of sciences in the medical degree. This opinion is based on four view points:

1) it is essential for good medical practice;
2) it provides the fundamental background necessary to understand the normal and patho-

logical aspects of the body; 3) it provides most of the terms used in medical vocabulary and 4) its research is fundamental for solving many clinical and biological problems.

1.1. Good medical practice

It has been estimated that the number of avoidable deaths per year in the United States of America is about 80,000 (Brennan et al., 1991). It is suspected that some of these deaths can be directly attributed to anatomical incompetence (Cahill and Leonard, 1999). This highlights, therefore, the need for continued training in basic sciences with the aim of avoiding mistakes during daily clinical practice. The findings of a questionnaire devised by the present authors (see section 2: view of clinicians and surgeons) suggests that a sound anatomical knowledge helps avoid mistakes during daily practice in 34.5% of cases for internal medicine specialists, in 55% of cases for pneumologists, in 80% of cases for ENT surgeons, and in 84.9% of cases for orthopaedic surgeons (Table 4). Thus, it is not surprising that CDP programmes are supported, and considered necessary, by many surgical and medical organisations around the world.

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CDP must take into account not only the anatomy considered as «*normal anatomy*» but should also be extended to include knowledge of anatomical variations (Sañudo et al., 2003). Anatomical variations, in contrast to anomalies, are defined as morphological changes that do not represent a handicap for the subject that holds them, although even a harmless variation can have negative effects under certain circumstances (Lippert and Pabst, 1985; Sañudo et al., 2003). Examples of variations could be associated with the bones (e.g. cervical rib), the muscles (e.g. extensor digitorum brevis manus), the blood vessels (e.g. median artery), the nerves (e.g. fusion of musculocutaneous and median nerves) (Bergman et al., 1988; Bergman et al., 2002).

The importance of anatomical variations in clinical practice is clear as knowledge of these will avoid confusion with pathological disorders or the missing of normal structures of a given anatomical region. For example, the knowledge that, in 18% of cases there could be two main arteries along the arm and elbow (one of them with a superficial course), could avoid malpractice performing a venous puncture in the elbow region or a forearm flap (Rodríguez-Niedenführ et al., 2001). Additionally, in order to make a diagnosis of a tumour in the dorsum of the wrist by imaging techniques such as MRI, it is necessary to take into consideration that, in 2% of cases, an extensor digitorum brevis manus muscle could exist and be mistaken with a benign tumour (Rodríguez-Niedenführ et al., 2002). Finally, it is important to note that the American Association of Clinical Anatomists (AACCA) has proposed that, within the undergraduate medical curriculum, there is a need to include knowledge of anatomical variations among the curricular objectives (Educational Affairs Committee, American Association of Clinical Anatomists, 1996).

1.2. Medical background

The long history of anatomy not only teaches us about the constitution of the human body but also introduces us to the history of science. Anatomy has many eponyms that, in many cases, relate to anatomists who, by their personal efforts and endeavours, contributed to establishing anatomy as the basic

foundation for medicine. Therefore, knowledge of such anatomists not only helps with learning anatomical structures but also provides us with knowledge about the workings of science. Furthermore, anatomy has always been linked with many biological and social questions. For example, the question of the origin of life arose via embryology and, through the dissection of human cadavers, the question of understanding death arose. Anatomy therefore gives a medical background that reaches far beyond its immediate biological dimension and is related with the history of science and with the origins and deaths of human beings.

1.3. Medical vocabulary. Anatomical terminology

Anatomy is the discipline that allocates most terms in a medical vocabulary (7,500 words). These names are applied in medicine worldwide but are also used among scholars in basic and applied health sciences (Moore, 1999).

The goal of finding an international vocabulary that enables precise communication among health care professionals has a long history that began with the creation of the *Basilea Nomina Anatomica* in the language of Latin (BNA, 1895) (continuing with the *Birmingham review* (BR) and *Jenenser Nomina Anatomica*) until, in 1955, a unified document that was created in Paris known as the *Nomina Anatomica*. However, due to different problems, it was not until the Lisbon meeting of the International Federation of Anatomical Associations (IFAA) in 1994 that there arose an agreement for a unified document and, in 1998, this was published under the new name *Terminologia Anatomica* (FCAT, 1998). The Spanish Anatomical Society (SAE) has promoted jointly with the Medical-Panamerica Publishers an edition of the *Terminologia Anatomica* that respects both columns of the original languages, Latin and English, but encloses a third column with translation of the terms into the Spanish language (FCAT, 2001).

In summary, the *Nomina Anatomica* or the *Terminologia Anatomica* are a list of names compiled for anatomists worldwide that represents

a common language for referring to structures of the whole body.

1.4. Medical research

In the XIX century, the Spanish Nobel Prize winner, Ramon y Cajal, wrote to his friend, Federico Oloriz (Professor of Anatomy in the Complutense University), telling him that descriptive anatomy was a dead science in which it was very difficult to find anything new. Cajal advised therefore that it would be better to move towards other fields that were waiting to be explored such as histology, genetics, physiology (Garcia-Carlos, 1974). If that opinion was already uttered in the XIX century, it is not hard to imagine what the opinion of many other anatomists is today! However, most anatomists understand that it is one thing to open up new frontiers in research and quite another “to cultivate the land that has been conquered”. In this respect, descriptive anatomy can still be considered as an active area of research because, with the changes and introduction of new technologies for diagnosis and daily clinical practice, anatomy is constantly being rediscovered. At the very least this is true in the sense that known, as well as unknown, structures can now be easily studied and visualised; something that nobody would have foreseen in the XIX century. This becomes obvious if you take as examples new techniques, such as surgical techniques based on endoscopy, or imaging techniques based on MRI.

The importance of descriptive anatomy in the XXI century is encompassed under the title of clinical anatomy. Anatomy is a morphological science that cannot fail to interest the clinician. The practical application of anatomical research to clinical problems is continuous in the daily clinical activity. Although, there is a tendency to believe that meaningful advances in anatomy are unlikely, constant revision is necessary.

Two facts that demonstrate that descriptive anatomy (clinical anatomy) is not yet dead are: 1) the increase number of papers about anatomy that are published in surgical or radiological journals and 2) the good health of at least two international journals devoted to publishing research in clinical anatomy (Clinical

Anatomy and Surgical and Radiological Anatomy Journals).

2. THE VIEWS OF CLINICIANS AND SURGEONS

The opinions of clinicians about anatomy was assessed by means of a questionnaire composed of 27 items that asked questions related to anatomy or dissection in their undergraduate period and in their clinical daily practice. The items had five possible answers (irrelevant, little relevant, relevant, very relevant and fundamental). Questionnaires were returned by 344 clinicians and surgeons belonging to different Spanish regions (Canary Islands, Catalonia and Madrid). In 75% of cases, the respondents were already specialised clinicians and surgeons (for >5yrs: 58%; for <5yrs: 17%) and, in 25% of the cases, they came from training residents.

Due to the diversity of specialists and disparity in numbers, we decided to study only a reliable and homogeneous sample. With that aim, two medical specialities were selected (internal medicine (n=38) and pneumology (n=42)) and two surgical specialities (ENT surgery (n=48) and orthopaedic surgery (n=67)) in order to test opinion. Data were analysed using the SPSS v.11.5 statistical package.

The findings show that there is a clear bias related to the clinician's speciality; in general, surgeons were more favourably inclined towards anatomy than physicians. Indeed, surgeons chose anatomy as the most important basic science for their daily clinical practice while physicians chose physiology (Table 1). Table 2 also shows that surgeons made a positive evaluation for anatomy (30-40% higher than for physicians). In this sense, surgeons considered anatomy more relevant in terms of their every day activity and in relation to physical exploration, interpretation of symptomatology, imaging techniques or during the therapeutical procedures while physicians considered anatomy less important but more relevant in all the items with the exception of the therapeutical procedures that logically are less relevant (Table 3). These results agree with a previous study made with samples of General Practitioners and Clinical Medical Students (Mompeó and Pérez, 2003).

Table 1. Results of the question how important are basic sciences in your daily activity?

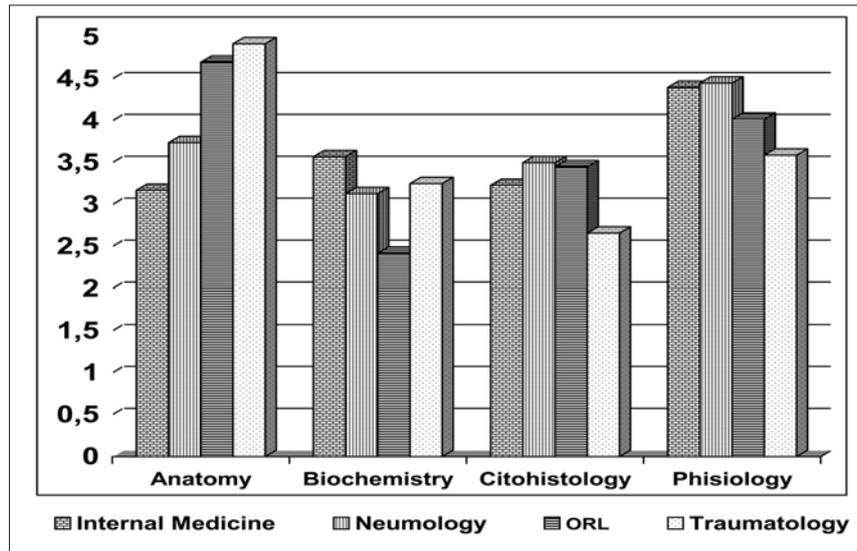
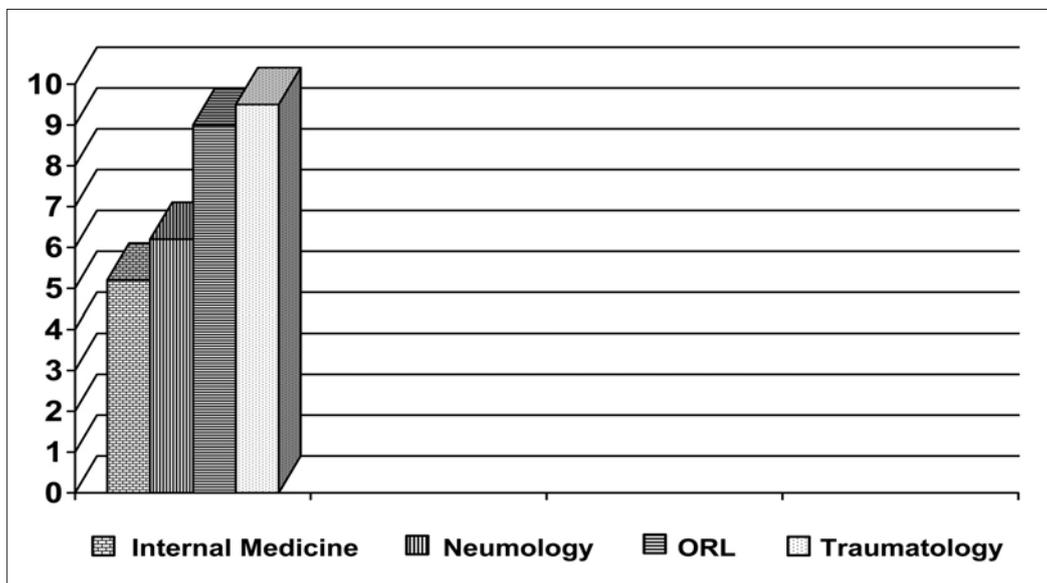


Table 2. Results of the question how is the important of anatomy in your daily clinical practice?



In summary, the responses to the questionnaires show that descriptive anatomy is the basic science considered most relevant by surgeons in their daily clinical activity, not only for making the diagnosis, but also for therapeutics. This fact reinforces the historical relation between anatomy and surgery, but it does not mean that physicians do not consider anatomy a very relevant discipline in their daily activity.

3. WHO SHOULD ORGANISE CPD COURSES?

Medical Professional Colleges recommend the introduction of periodic assessments with the aim of improving medical and surgical

competence. In other words, they want to promote the Continuing Professional Development (CPD). For example, the Royal College of Surgeons of England is committed to enable surgeons to achieve and maintain the highest standards of surgical practice and patient care. This kind of institution does not exist in Spain but did exist during the Enlightenment period of the XVIII and XIX centuries in Cádiz (1748), Barcelona (1764) and Madrid (1787) (Usandizaga, 1948; Burke, 1977; Astrain-Gallart, 1996). These institutions appeared in response to the academical world that took a more theoretical and conservative approach, in a period when the maintenance of the Spanish empire needed well trained surgeons for the

Royal Navy (Cádiz) and Royal Army (Barcelona). Later, concerns about the general population appeared and, consequently, the Royal College of San Carlos was created in Madrid (Astrain-Gallart, 1996).

Unfortunately, these institutions disappeared after the French occupation of Spain because many of their supporters were open-minded people that felt betrayed by the Spanish King Fernando VII (Burke, 1977). In the case of the Royal College of San Carlos of Madrid, it resulted in this institution joining the Alcala University and building a Unified Medical and Surgical School (Usandizaga, 1948; Burke, 1977).

As a consequence, in Spain at the present time, the only institution authorised to store human cadavers for surgical training are universities. Therefore, surgeons that wish to undertake CPD courses with cadaveric material must contact anatomy departments.

Finally, we would like to report that, from data emanating from our questionnaire mentioned above, surgeons believe that anatomical courses are necessary in their CPD in 95.45% of cases (Orthopaedic surgeons) or 97.7% of cases (ENT surgeons). They are also of the opinion that anatomists should participate in the CPD courses in 92.42% (orthopaedic surgeons) or 95.5% (ENT surgeons) (Table 4).

Table 3. Results of the question: how is the important of the anatomical knowledge in your daily activity?

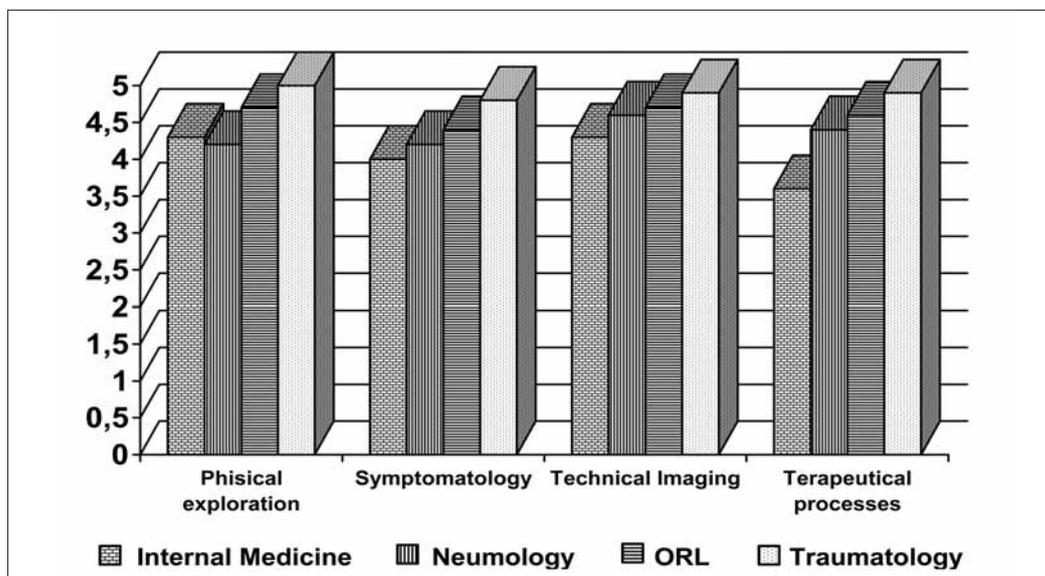


Table 4. Results of the questions: should anatomists participate in the Continuing Professional Developing courses (CPD)? (1st column), Are anatomical courses necessary in your CPD? (2nd Column) and could anatomical knowledge avoid mistakes in daily practice? (3rd. Column).

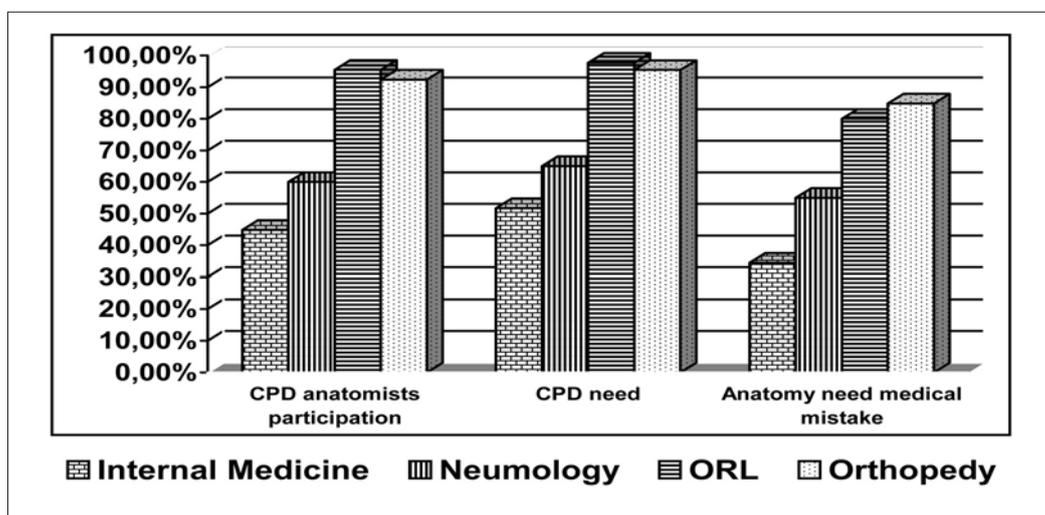
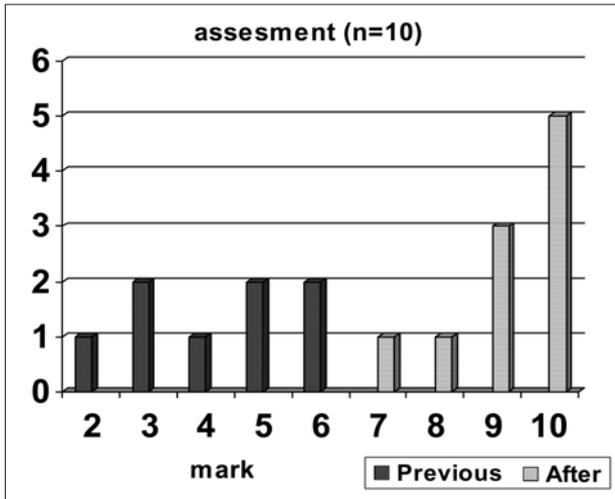


Table 5. Results of previous and after assess of the II course of surgical anatomy of the neck (2006).

4. WHAT ARE THE CRITERIA APPROPRIATE FOR SURGICAL CPD?

In Spain, if a clinician went to an anatomy department with the aim of organising a CPD course, there are two kinds of reactions that he could be faced with. The clinician would either receive a simple offer of the department's facilities with an exclusive commercial interest or would be required to show real interest in getting involved in the project.

From our point of view, courses using cadaveric material should be the result of an adequate balance between two different sensibilities: surgical and anatomical. Therefore, they should not be made only with the aim of performing surgical procedures as, in these cases, most of the teaching potential of the human cadaver is undervalued. We therefore strongly recommend courses that show both a deep view of regional anatomy and also the performance of the most relevant, or attractive, surgical techniques currently available.

Financially, the money that are generated with the courses should be provided to the Department in order to be invested in improving facilities, infrastructures, research grants, travel grants and for salaries.

5. HOW TO ORGANISE A COURSE. THE MAIN PRINCIPLES

The following comments are based on our experience organising courses for ENT sur-

geons and Orthopaedic surgeons from 1997 to date.

In our opinion, the following five points are essential for the organisation of a successful course:

1. To have a «dissection guide» recording every procedure that will be undertaken.
2. To be more practical than theoretical.
3. To stimulate the individual work (one region for each attendant) with a high standard of supervision.
4. To provide adequate facilities and equipment.
5. To be methodical in organising daily activities and sessions.

Our courses commence by distributing a questionnaire to the course participants in order to assess the level of their previous knowledge. The questionnaire has 15 items with five possible answers, only one being the correct answer. Questions are based on clinical interest. On completion of the course, the same questionnaire will be given to the participants. Results from previous courses show that participants failed in more than 60% of cases in the preliminary assessment but passed in more than 80% in the final assessment (Table 5).

Sessions are preceded by a very short lecture (no more than 10 minutes) where the same images and contents that are displayed in the dissecting guide are used (Fig. 1). In the theoretical session, the objectives for the session are established.

The dissecting guide was elaborated according to topographical or regional criteria. In this way, it follows a superficial to deep sequence. This means dissecting from the skin to deeper structures, passing through superficial fascia, and trying to search for every relevant structure that is located in a given layer (Fig. 2).

After the short lecture, participants go to the dissecting room where they perform their individual work. We always try to attain the ratio of one participant for one anatomical region (Fig. 3). During the practical sessions, the doubts that arise can be checked with the help of the dissecting guide or by seeking advice from supervisors.

At the commencement of each session, we assess whether the objectives of the previous

Figure 1. Illustrate a lecture done just before going to the practical session in the dissecting room.



Figure 2. Illustrate a workstation with the dissecting guide on the top left corner.



Figure 3. Illustrate the atmosphere in the dissecting room of the Department of Anatomy I of the Complutense University of Madrid during the development of a Continuing Professional Developing course of Head and Neck.



Figure 4. Final display of the course, a photo of attendants, supervisors and professors.

Table 6. Questionnaire to evaluate the quality of courses.

1. Overall evaluation of the course
2. Facilities and equipments
3. Relation supervisors-attendants
4. Scientific level of the supervisors
5. Have the course satisfied your expectations?
6. Do you recommend the course to other colleagues?
7. Has the course an appropriated price?
8. Was the catering adequate?
9. Comments and suggestions

session have been accomplished and therefore whether the participants can proceed with the dissection of the next layer/objectives.

In conclusion, the course is a combination of theoretical lectures and practical activity

with intervals for lunch or coffee breaks. At the end of the course, a feedback questionnaire about the quality of the course is distributed to the participants (Table 6) and a photograph of the group is taken (Fig. 4).

CONCLUSION

Anatomy is a fundamental subject for both medical and surgical training. Anatomical departments must collaborate with clinicians organising Continuing Professional Development (CPD) activities. CPD courses must be mainly practical in content and organisation, respecting the learning of anatomy as well as aiming at performing surgical techniques.

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