

**Temas en Debate**

**PARTE II: SITUACIÓN DE LAS UNIVERSIDADES ARGENTINAS Y LATINOAMERICANAS EN RELACIÓN AL MATERIAL CADAVÉRICO PARA LA ENSEÑANZA DE LA ANATOMÍA**

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**RESUMEN**

Para esta segunda parte se realizó una amplia invitación. Publicamos los aportes de destacados autores cuya generosa contribución al Debate lo jerarquiza. Las preguntas enviadas por el Dr. Thambi Dorai fueron enviadas a los participantes del Debate inicial y sus respuestas incluidas en el presente artículo.

**Palabras clave:** enseñanza de la Anatomía; aprendizaje de la Anatomía; disección de cuerpos; donación de cuerpos; procuración de cuerpos

**ABSTRACT**

A wide spread invitation was distributed for this second part. We are publishing some generous contributions from relevant authors which hierarchized the Debate. Questions sent by Dr. Thambi Dorai were envied to all the participants in the initial Debate and their answers included in the current article.

**Key words:** Anatomy teaching; Anatomy learning; body dissection; body donation; body procurement

**WHY DISSECT**

**(from the preface of Essentials of Gross Anatomy)**

**Jack Stern**

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I should add that one cannot overemphasize the value of dissection as an aid of learning relationships. This is not because dissection enables one to see things; atlases and prosections can fulfill that purpose. Rather dissection is so important because it forces the students **to look for** things. Learning the structure of the human body is like taking up residence in an unfamiliar city. It's nice to have a map, and even to be driven around by a friend, but you can never appreciate the city's organization until you have made repeated (often unsuccessful) attempts to find your own way.

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## QUESTIONS FOR THE DEBATE

**C.R. Thambi Dorai**

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1. What is the current prevalence in universities in the Argentine and Latin American regions in using cadaveric dissection for undergraduate and postgraduate surgery courses for teaching of pure anatomy and surgical anatomy respectively?

What proportion of the syllabus in anatomy is taught by cadaveric dissection currently? Are there any regional differences in their use in these universities? If differences exist, have the reasons for these differences looked into? Do the reasons relate to availability of cadaver or student and staff preferences?

### **Answers**

**Prof. Julio Cárdenas Valenzuela:** Currently, and for reasons of the limited time available in the curriculum, there is no anatomical dissection performed by undergraduate students. The students always prefer the dissection, the problem is the short time, less and less, that the teaching of the discipline has with respect to the rest of the subjects. Therefore, it is a condition influenced by the time of each particular program. In relation to the teaching of surgical anatomy, this is done in free form when students of surgery, or scholars of other specialties, voluntarily and spontaneously approach to dissect

**Prof. Eduardo Olivera:** At the University of the Republic of Uruguay, we use cadavers for teaching during undergraduate and postgraduate courses. In undergraduate teaching is based on showing dissections made by teachers, however for postgraduate courses students are those who perform the dissection and practice surgical techniques. During the undergraduate course the proportion of use of dissection of corpses for teaching is 90-95%.

**Prof. Guillermo D. Prat:** Teaching anatomy using cadaveric material is essential both in grade and postgrade. In our department, Facultad de Ciencias Médicas de la Universidad Nacional de La Plata, we base grade teaching on the use of anatomical cadaveric structures. Elements, anatomical repairs and topography are the root for the learning process. The dissection of bodies is crucial, without it, there are no anatomical pieces. This are made by students who are teachers assistants, during this process they expand their knowledge, learn basic surgical maneuvers and how to use the surgical equipment. Those students who are taking the course for the first time won't participate of the

dissection process due to the lack of bodies in relation with the amount of new students every year. Instead, they will learn from a cadaveric piece dissected by a senior student. Postgraduate students can join limited workshops that are oriented to residents or recently graduated. There are complements that help to solidify the knowledge of the cadaveric anatomy, for example imaging methods, 3D digital anatomy and 3D printing. I do not think there is a preference regarding the use of cadaveric material for teaching, but there is a lack of bodies to dissect that generates a need for the use of other methods.

**Ac. Richar Paredes Orué:** In Peru the great majority of medical schools use corpses to teach anatomy, in Lima, the capital of the country, there is a private university that is the exception. The postgraduate units (medical residency) that prepare future specialists work independently of undergraduate and do not use corpses for the teaching of courses of the surgical specialties. In the medical school of the National University of San Agustín of Arequipa, anatomy is an annual course of 10 credits, is dictated in two semesters, each of five credits. To practice corresponds 3.12, in each semester, which is equivalent to 62.4 % of the total course. At the only private university in Arequipa the percentage of dissection is almost the same as ours. In relation to other medicine schools of Peru, we do not know the percentage of the dissection.

**Prof. Oscar P. David:** Actually, in the Department of Anatomy A of the Faculty of Dentistry of the National University of Córdoba the use of cadavers and their dissection in undergraduate and postgraduate teaching is poor. In this regard we must say that cadaveric preparations are used for teaching, but not dissection. That is, they use preparations that have already been dissected to show a region or some elements in particular. This is because we have not received corpses for years. The ones we currently possess are many years old and are carefully treated for avoiding handling damage. Most of the newer teachers have not had the opportunity to dissect. To this inconvenience should be added the lack of building infrastructure for the handling of corpses in the current conditions, since all the preparations that are available are mostly head / neck but not complete bodies since there is not even physical availability for their storage.

**Prof. Susana N. Biasutto:** In the Faculty of Medical Sciences - National University of Córdoba, cadaveric material is preferably used for undergraduate teaching due to the shortage of bodies. Our first year students don't dissect by themselves. Most of the dissections are performed by older students who act as student-

assistants, supervised by professors. The syllabus in Anatomy is all taught with prosected material, specifically prepared for this aim. As all professors have been, at the time, student-assistants we prioritize the teaching of young people who demonstrated special interest and conditions.

2. Apart from cadaveric dissection by students, do alternative paths like use plastinated anatomy materials are used in anatomy teaching for undergraduate and postgraduate surgery for anatomy teaching?

#### **Answers**

**Prof. Julio Cárdenas Valenzuela:** Of course, there are models of plaster, wax, preserved museum preparations, even "papier mâché", as well as 3D imaging software that complements the anatomical study.

**Prof. Eduardo Olivera:** We use cadaveric preparations in vials with formaldehyde (cuts and special preparations), imaging studies (CT, MRI, simple RX and contrast, vascular studies). We are starting to develop a plastination laboratory, but we still do not have material for the classes

**Prof. Guillermo D. Prat:** The use of cadaveric pieces for both teaching and learning anatomy is essential. The imaging methods are a great tool to complement the learning process because the anatomical and topographical slices are the same. Also, 3D images are used to show the different angles of the structures. Besides, 3D printed models are used as another helpful tool. On our daily practice it is not common to use plastinated pieces.

**Dr. Richar Paredes Orué:** We have used three interactive tables for two years, we also have models. We are making arrangements for the acquisition of a plastination equipment.

**Prof. Oscar P. David:** The specialty of surgery shows a great avidity of anatomical knowledge and they use the preparations for recognition of structures but they cannot dissect to clearly understand the surgical anatomy. Historically, a strength present in the professionals graduated at the UNC was the vast clinical experience. For several years, legal obstacles have taken away a strength that is highly valued all over the world.

**Prof. Susana N. Biasutto:** Our students have access to cadaveric material fixed and prepared by different methods (paraffin specimens, transparencies, vascular and/or ductal injections, solution immersed pieces, etc.) exposed in the Anatomical Museum "Pedro Ara", but we haven't plastinated material.

3. Have the subjects/topics in anatomy that are better taught by cadaveric dissection when

compared to other aids like use of plastinated specimens/computer aided teaching identified?

Is a study on this using the subject experts, teachers and students help in optimal use of cadaveric teaching?

#### **Answers**

**Prof. Julio Cárdenas Valenzuela:** Apart from the personal request for dissections according to the postgraduate specialty, there is no study that has identified any particular region or topic better than another for the teaching of anatomy through dissection. It does not mean that there is not. To teach a surgical technique it is the surgeons who best teach it. For anatomy, it is the anatomy teachers and student helpers who best teach it.

**Prof. Eduardo Olivera:** We would like to use other resources such as plastination or augmented reality, but we do not have them yet. So we base the teaching on preparations of cadaveric dissection.

**Prof. Guillermo D. Prat:** As I previously mentioned, although the cadaveric pieces are the root of the anatomic teaching-learning process, there are other methods to compliment it, such as imaging methods, 3D digital anatomy and 3D printing.

**Dr. Richar Paredes Orué:** Postgraduate students - specialty, they depend directly on the unit of postdegree of the medical school, totally independent dependence of the department of human morphology, in charge of the dictation of the course of human anatomy.

**Prof. Oscar P. David:** Although here is a generalized consensus about the importance of the use of corpses to learn general anatomy and surgical anatomy in postgraduate studies, these elements are not available. We try to use the abundant multimedia systems currently available that allow a more complete idea of three-dimensionality as a way to alleviate the lack of cadaveric preparations and dissection as a teaching-learning method, but knowing that there is no better model to learn anatomy than the human body.

**Prof. Susana N. Biasutto:** Certainly the use of cadaveric material have shown to improve teaching/learning process in relation to other educational resources, instead we recognize the usefulness of technology (plastinated specimens are also cadaveric material) as a very important supplementary option. S.N. Biasutto, L.I. Caussa, E.L. Criado del Río. 2006. Annals of Anatomy - Anatomischer Anzeiger, 188: 187-190. DOI: 10.1016/j.aanat.2005.07.007.

4. Is the "silent mentor program" where the bodies of deceased persons are donated and utilized for teaching prior to formal burial adopted in the above regions especially for postgraduate

operative anatomy teaching? If used how prevalent is it? If not, the reasons for not being used and the feasibility of using them? (Silent mentor program is popular in Korea and is currently used in a limited way in Malaysia for operative anatomy teaching).

#### **Answers**

**Prof. Julio Cárdenas Valenzuela:** In Chile, the undergraduate teaching is about the normal anatomy, so, the history of the donated cadavers are used by the dissector, more to define the regions to prepare than to save the bodies for later.

**Prof. Eduardo Olivera:** We have no experience in "silent mentor program" and we are not planning anything in that way.

**Prof. Guillermo D. Prat:** Bodies used on our University and in Argentina are donated by the person while they are alive or their family. If someone dies on a public hospital and the body is not claimed by their relatives, the government decides to make the donation. Another possibility of donation occurs when an organ donor is rejected by the transplantation committee. Bodies that had suffered a violent or suspicious death are not accepted due to risk of being claimed by the justice.

**Dr. Richar Paredes Orué:** For the learning of anatomy is required in the first instance a theoretical knowledge that is reinforced with dissection, through which the student has an idea of the journey, relationship of the structures, to then understand the function and clinical application. The teaching of anatomy through corpses is done by the teachers of the course, we do not have the category of experts. There is no program for living people to donate their body after dying, neither laws that allow it.

**Prof. Oscar P. David:** The silent mentoring program is unknown to us in its implementation although we understand that any element that helps overcome this short coming could be very useful

**Prof. Susana N. Biasutto:** We have not had even the possibility to discuss this topic, as we are now trying to develop a formal donating program. Just to explain the importance we assign to surgical anatomy training consider that most of our professors have surgical specialties, and we assume how much we could do if we had sufficient number of corpses!. The few corpses received each year are donated bodies, but most of the people don't know this possibility because of the lack of a donating program. Anyway, students never have access to the donor personal or clinical information.

## **THE CADAVER IN ANATOMY EDUCATION: THE IMMORTAL TEACHER Nabil Eid**

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With many descriptions such as student's first patient, student's great teacher, and student's silent teacher, the cadaver should be recognized as the immortal teacher for medical students. The *Kentai* (voluntary body donation in Japanese) gives the student a great chance for the dissection in an environment of respect, friendship and merciful communication between the student and the cadaver. The benefits of dissection mostly fall into three categories: knowledge acquisition and integration, development of skills (specifically dissection of nerves and vessels), and attitudes (respect to first patient and team work). Accordingly, imaging technology can never provide the great lessons that students learn from silent teacher. Dissection of cadavers gives the chance to discover variations in vessels, nerves, muscles, etc..., which have surgical and embryological implications. Education and testing medical students should be performed on cadavers and should never be replaced by images scanned from books or other sources.

Cadavers who pledge their bodies to science often think that their bodies will be used as they wished. Medical students after graduation always remember the first meeting with cadaver during anatomy class; the first time they touched his body to feel bones, and the first time they used their scalpel to cut skin to get access to organs, nerves, vessels and muscles. Anatomical variation detected by medical students during dissection course will never be forgotten after graduation. Whether they are surgeons or radiologists, they often remember these variations; therefore, the cadaver should be recognized as the immortal teacher.

In Japan, *Kentai* (Started about 50 years ago) provided medical schools with required cadavers for anatomy teaching (almost one body every 4 students). Therefore, no problem regarding supply of cadavers is found until the present moment. A distinct feature of body donation in Japan is the fact that the ashes after dissection are returned to the families of body donors. Shortage of cadavers for anatomy education in Argentine and some Latin American universities is a great problem, which should be solved by encouragement of body donation programs such as in Japan and Western countries.

The use of imaging technology, prosected human material and plastinated specimens may help but not enough for anatomy teaching because it lacks active dissection by students.