

### ANATOMY EDUCATION IN KAZAKHSTAN: PRESENT AND FUTURE

*The Republic of Kazakhstan have joined the Bologna process in 2010 with the purpose of promoting mobility of students and active involvement into European dimension of higher education and automatic recognition of comparable academic degrees, adopting a three-cycle system of study (BA, MA, PhD). Anatomy education is now based on introducing of credit and module technologies, which assigns much more attention to students' independent study and assessment of study performance. In that connection supply of medical students with numerous visual aids and cadaverous material became much more important. It became necessary to revise the existing legal foundation of body donation and awareness campaigns among the public to overcome mental habits and religious objections to anatomic dissections and postmortem examinations. Departments of anatomy all over the Republic began inviting colleagues from abroad for sharing experience on anatomy teaching, which have resulted in active introducing of modern ways of anatomy teaching (problem-based learning, body painting, case-based and practical learning methods, independent and computer-based learning).*

**Keywords:** anatomy, credit and module technologies

Kazakhstan is a young state gaining independence only 20 years ago after the collapse of the Soviet Union and its totalitarian communist system. Higher medical education problems have began long before the USSR collapse due to legal and economic aspects of the medical universities. Stagnation in social and political system during last few decades before the USSR collapse have caused the deficit of specialists which is crucial up to now at anatomy departments of medical universities all over Kazakhstan. This is due to the fact during the transition period from planned socialist economy to market economy university teachers' salaries went down and teaching stopped being attractive for graduates of medical universities.

After gaining independence in 1991 and the economic crisis gradually abating, Kazakhstan educational institutions began searching ways of development and integration into the world education and science level. In particular, substantial changes took place in teaching anatomy at medical universities. Getting access to foreign scientific literature, we began actively implementing modern methods of teaching anatomy used in other medical universities of the world (Chang-Seok Oh et al., 2009; Adams C.M. et al., 2011; Jacqueline A. et al., 2012; Seok Yoon Kang et al., 2012).

Since historically Kazakhstan was a part of the USSR, medical universities, as a rule, and anatomy departments, consequently, had no direct contacts with their foreign colleagues and their scientific and education methods activity was restricted to the standards dictated by Moscow.

The whole higher medical education system in the former USSR was based on the German model of medical education adopted in 19-th century. Anatomy departments were not allowed to compile their own curriculums and schedule teaching periods per a semester or anatomy systems (sections). And traditionally students studied different systems of anatomy within 3 semesters during the 1-st and half of the 2-nd year.

The 1-st year students' curriculum was as follows:

- within the 1-st semester – the musculoskeletal apparatus: osteology, arthrosyndesmologia, myology;

- within the 2-nd semester - the internal system – digestive, respiratory, urinary, genital, endocrine, central nervous and senses.

The 2-nd year students during the 3-rd semester studied cardiovascular and peripheral systems. At the end they took the exam in anatomy and had no more lessons and seminars on anatomy.

Labs and lectures as per a semester were distributed as follows:

During the 1-st semester:

- Two hours practical seminar, twice a week, total hours – 72;

- One hour lecture, once a week, total hours – 18.

During the 2-nd semester:

- Two hours practical seminar, twice a week, total hours – 72;

- One hour lecture, once a week, total hours – 18.

During the 3-rd semester:

- Two hours practical seminar, twice a week, total hours – 72;

- One hour lecture, once a week, total hours – 18.

Thus, it takes in total 270 hours for teaching the whole course "The Gross Anatomy", including practical seminars and lectures.

Within the three semesters two cadavers are dissected by each group of students (10-12 in each group). The 1-st year students dissect the one cadaver to demonstrate the muscular system, the other – in the 2-nd year to demonstrate vessels and nerves. Also the 1-st year students during the second semester dissected the internal organs, preparing specimen, some of preparations are kept in the Anatomy Museum for demonstration to future students.

Since under the communist regime in the former USSR human rights were not strictly respected, there were no clear rules and restrictions of supplying medical education institutions with cadavers, and, consequently, anatomy departments had no problem with cadaver material and human internal organs.

After gain of sovereignty and formation of a legal state the medical institutions of Kazakhstan came to face deficit of cadaver material for anatomical education and dead body organs for transplantation, the same problem was observed in some Asia countries (Shrikant A., et al., 2012). It became urgently necessary to provide legal foundation of cadavers supply for medical education and research.

We took some measures to solve this problem, namely, we managed to have the addendum "Body Donation" made to the law of the Republic of Kazakhstan on "Health Care" and approved by the Parliament and signed by President on July 7, 2006. Main clauses of the Article "Body Donation" are as follows:

1. A body is donated under a written and witnessed consent of a bequeather given prior to death.

2. Information about body donation is strictly confidential.

3. Besides bodies donated by Will bodies of the deceased not identified or claimed by the first relatives within 45 (forty five) days of receipt by the medical examiner's office are treated as donated.

4. A donated body must be used for anatomical study education, medical research and biomedical investigation.

Since the above Addendum did not prove to be effective enough and did not solve the problem of cadaver material supply for teaching purposes a further measure had to be taken by a group of Kazakhstan anatomists. We have worked out the Act named "Procedures and Conditions of Body Donation and Receipt of Unclaimed Bodies by Medical Education and Healthcare Institutions". It was included into the Code "On Healthcare" approved by the Government on December 30, 2009. The Act which we apply as a main document for regulation supply anatomy departments with cadaver material for education and research is as under.

**ACT. On Procedures and Conditions of Body Donation and Acceptance of Unclaimed Bodies by Medical Education and Healthcare Institutions.**

1. The Act specifies the procedures of body donation and unclaimed bodies and conditions of usage of cadaver material for the purposes of medical education, medical research and scientific studies at higher medical and healthcare institutions.
2. A body of the deceased is donated to medical and healthcare institutions as an anatomical gift on the base of his written and authorized consent prior to his death.
3. A body of the deceased can be accepted as anatomical material by medical and healthcare institutions if the death was not violent and a body was not claimed by the first relatives or third parties within 45 (forty five) days after his death for burial.
4. A healthcare hospital management must inform the deceased patient's relatives about his death, if his address data is available in this hospital. Delivery of an unclaimed body to higher medical and healthcare institutions is made under guidance of a committee, warranted by representatives of the pathologist department and a healthcare representative of the hospital. The Acceptance Statement of delivery is signed by representatives of both sides and made in two copies.
5. The examples of diseases that would disqualify a donated body for medical and scientific study include: contagious diseases, AIDS, plague, anthrax, viral hemorrhagic fever, tularemia, cholera.
6. The hospital pathologist department personnel have the following duties:
  - a. If a deceased person has no identified next of kin or any authorized official, after 7 (seven) days of his being in the morgue, a hospital management representative or a pathologist must send a written notice to a local police department (according to his residence or, if no address data, according to the place where the death occurred) about the fact of the unknown body being in the morgue and about searching claimants. Primary sanitary embalming was made by injecting the embalming chemical into the abdomen and thorax. The embalmed body is kept in the refrigerator under temperature from 0 to +4°C.
  - b. If no claimants to identify the deceased or any authorized official approached the local police department after 15 (fifteen) days from the time of the first notice about the deceased being in the morgue, the second notice is sent to the police.
  - c. If no claimants to identify the deceased or any authorized official approached the local police department after 40 (forty) days from the time of the second notice about the deceased being in the morgue, the body is acknowledged as "unclaimed". After the Acceptance Statement of delivery of anatomical material is filled the body is delivered to a medical institution for study and research.
7. A representative of the medical institution anatomy department is appointed responsible on the anatomical cadaverous material appropriate maintenance and storage. He must keep a special book where all cadavers should be enlisted with the following information:
  8. name and surname of the deceased and his age by the moment of death;
  9. date of the deceased delivery to the medical institution from the morgue
  10. place of his death;
  11. After the unclaimed body accepted into the medical institution and enlisted in the above-mentioned way, the second embalming is made by injecting embalming fluid into the vessels. Corpses after second embalming are kept in tanks with fixing solution to allow adequate fixation. If any putrefactive infestation is noted, the corpse is to be dissected to prepare skeletal specimen.
12. Usage of cadaverous material for study and science provides for preparation of anatomical preparations in traditional way and recently by plastination and consists in:
  13. preparation of a separate anatomical specimen;
  14. preparation of separate anatomical complex of organs;
  15. preparation of separate anatomical organs.
16. For persons involved into usage of cadaverous material for education and science purposes, including students, it is compulsory to adhere to deontology and medical ethic principles during all stages of work with an unclaimed body in whole, or with his separate organs or tissue.
17. Medical institutions and healthcare hospitals representatives are obliged to assure people who intend to donate their bodies, that all human remains will be treated with dignity and respect that our society customarily grant the dead.

Unfortunately, due to national mentality and national habits alongside with religious objections, anatomic dissections and postmortem examinations in our country are nearly always and actively protested. It means that all legal acts and addendums are not yet effective enough by present. The autopsy and the organs dissection is thought to be disrespectful and insulting the deceased and profane the memory of him. Due to that the medical institutions have to carefully preserve the anatomical preparations they have and to import the plastinated anatomical preparations from Russia. We know that it will take time and efforts to change the mindset of the wider part of Kazakhstan general population toward body donation. We hope that it is possible through awareness campaigns and educational programs gradually to encourage more people for body donation, to show that medical students will gain first-hand experience of the human body dissecting donated cadavers. When more people realize that this is the best way for future doctors to study anatomy, then the idea or possibility to become a prospective donor will not possibly seem so immoral or awful.

Solution of cadaver material shortage is actual now also because of Kazakhstan taking part in the Bologna Process in 2010. The purpose of it is promoting mobility of students and active involvement into European dimension of higher education and automatic recognition of comparable academic degrees, adopting a three-cycle system of study (BA, MA, PhD). Teaching anatomy is based on introducing of credit and module technologies, which assigns much more attention to students' independent study and assessment of study performance. Full supply of students with numerous visual aids and cadaverous material became much more important.

Upon introducing of credit and module technologies and adopting three-cycle system of study, we have changed number of hours and schedule of teaching anatomy. Now the 1-st year students begin to study the anatomy during the 2-nd semester and study the following sections: osteology, arthrology, myology and central nervous system. The 2-nd year students during the 1-st semester study the regional anatomy: the head and the neck, the thorax, the abdomen, the pelvis, the upper and lower limbs. The 3-rd year students study the anatomy by the modules, based on systems.

There are 8 modules: 1. The nervous system; 2. The respiratory system; 3. The hematopoietic organs and the immune system; 4. The digestive system; 5. The urogenital system; 6. The endocrine system; 7. The senses; 8. The musculoskeletal apparatus.

The 3-rd year students took the module teaching very positively, since these modules are integrated with adjoining subjects – the physiology, the pathological anatomy, the pathological physiology, the biochemistry, the pharmacology and the therapy.

To open wider and new lines of communication and get integrated into the world education area our universities began to invite well-known colleagues from abroad. Thus, in November of 2011 the Department of the Gross Anatomy of the Kazakh National Medical University was visited by the Prof. Scott Miller from the Department of Radiology of the University of Utah, the USA.

Prof. Scott Miller has had the lectures on the following topics:

- a. current concepts in anatomy education;
  - b. publications in western journals.
- and scientific seminars:
- a. imaging methods in anatomical sciences;
  - b. nanotherapeutic drug delivery systems and applications of small animal imaging methods;

- c. bone biology;
- d. radiation and human health.

Dr. Miller's seminars and lectures have had a great interest among students and teachers and proved to be very useful for both: teaching and learning. The university lecturers and teachers applied Dr. Miller's methods of teaching in their practice and noticed satisfactory feedback. Current concepts in anatomy education of a different foreign university proved to be very close and comprehensible for us and had a large degree of applicability in our lectures and practical seminars. It speaks well of the University management policy directed to widening of stable professional contacts with colleagues abroad, especially from Europe and the USA.

#### CONCLUSION.

For involvement into European dimension of anatomy education at higher medical institutions and after Kazakhstan joining the Bologna process our medical universities introduced credit and module technologies of anatomy teaching. Benefitting from exchange of teaching anatomy experience from other medical universities abroad, we began implementing new methods of anatomy teaching.

Like in other Asian states Kazakhstan also has faced the shortage of cadaver material for dissection, research and transplanting. Urgent necessity of forming a legal regulation of cadaver material supply for anatomy education and scientific research made the Kazakhstan anatomists to apply to the Government with proper requests. Much is to be done to spread the population's awareness about body donation and willingness to donate notwithstanding stiff opposition based on religion and mentality. Special educational campaigns should be launched promoting the meaning of body donation among different levels of the population alongside with further development of programs of donating bodies for anatomical dissection and research.

To get integrated into the world education area and upgrade standards of anatomy teaching the medical universities management in Kazakhstan started inviting colleagues from well-known medical universities abroad to make lectures and have practical seminars to medical teachers and students. Encouraging and positive results of such visits are marked by both, teachers and students.

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#### ҚАЗАҚСТАНДАҒЫ АНАТОМИЯНЫҢ ҚАЗІРГІСІ МЕН БОЛАШАҒЫ

**Түйін:** Қол жетімді білім үшін, оқу сапасын әрі қарай жетілдіруге, ашық және алған дипломы білім санағымен сәйкес болу үшін (бакалавриат-магистратура- докторантура PhD) және біртұтас европалық білім үрдісіне қатынасу үшін Қазақстан 2010 жылы Болон үрдісіне кірді. Осыған байланысты Медицина Университеттері анатомиядан сабақ жүргізудің кредиттік – модульдік технологиясына өтті, ол өз ретінде студенттерді көптеп қорнекті құралдармен мәйттік препараттармен қамтамасыз етуді қажет етеді. Сондықтан өлгендер мүрделерін іреп-союға медицина университеттеріне өткізу үшін мұраға қалдыру туралы заңнамаларды қайта қарауды және бағдарламаны жетілдіруді керек етті. Сонымен қатар анатомия Департаменті шет елдерден визитинг профессорларды шақыра бастады және ғаламдағы Университеттерде қолданылатын (PBL, бодипейтинг, пластилин мен балшықты пайдалану, casebased and practical learning methods, independent and computerbased learning) анатомиядан сабақ өткізудің заманауи әдістемелерін белсенді ендіруде.

**Түйінді сөздер:** анатомия, кредиттік – модульдік технологиясы

#### ПРЕПОДАВАНИЕ АНАТОМИИ В КАЗАХСТАНЕ: НАСТОЯЩЕЕ И БУДУЩЕЕ

**Резюме:** Казахстан присоединился к Болонскому процессу в 2010 году для доступности образования, дальнейшего повышения его качества, прозрачность и сопоставимость дипломов и степеней (бакалавриат – магистратура – докторантура PhD) и участие в едином европейском образовательном процессе. В связи с этим медицинские университеты начали переходить на преподавание анатомии по кредитно-модульной технологии, которая требует обеспечения студентов максимальным количеством наглядных пособий и трупного материала для самостоятельного усвоения учебного материала. Это потребовало пересмотра законодательства и разработке программы по завещанию тел умерших для передачи в медицинские университеты на анатомирование. Также кафедры анатомии стали привлекать визитинг профессоров из-за рубежа и активно внедрять современные методы преподавания анатомии, используемые в других университетах мира (PBL, бодипейтинг, использование глины и пластилина, casebased and practical learning methods, independent and computerbased learning).

**Ключевые слова:** анатомия, кредитно-модульная технология.