

## **Medical Education around the World**

### **Medical Education in Romania: Tradition and Innovation**

SIMONA MUREȘAN<sup>1</sup>, ANCA MEDA GEORGESCU<sup>1</sup>, LEONARD AZAMFIREI<sup>1</sup>,  
CRISTINA OANA MĂRGINEAN<sup>1</sup> and DAVID CM TAYLOR<sup>2</sup>

<sup>1</sup> University of Medicine and Pharmacy of Tîrgu Mureș Tîrgu Mureș, România

<sup>2</sup>Gulf Medical University, 4148, Ajman, United Arab Emirates

Corresponding author:

Anca Meda Georgescu

University of Medicine and Pharmacy of Tîrgu Mureș

Gh. Marinescu Street, no 38, Tîrgu Mureș, România

E-mail : [ancamedageorgescu@umftgm.ro](mailto:ancamedageorgescu@umftgm.ro)

Tel: +40744 335 657



## **Medical Education in Romania.**

### ***General Context***

Romania is a republic located in the geographical centre of Europe, half way between the Atlantic Coast and the Urals, in the north of the Balkan Peninsula. It has an area of 238,391 square kilometers (92,043 square miles). The country is bounded in the north by Ukraine, on the east by Moldova, on the southeast by the Black Sea, on the south by Bulgaria, on the southwest by the Serbia and on the west by Hungary (see figure 1). Its capital and its largest city is Bucharest, which is the sixth largest city in the European Union (RNIS 2016).



*Figure 1 Map of Europe showing Romania*

Since December 1989, when the political system changed, Romania has actively pursued a policy of transition from communism to democracy, strengthening relations with the West in

general, and specifically with the U.S. and the European Union. Romania formally joined the North Atlantic Treaty Organization (NATO) in 2004, and acceded to the European Union on January 1, 2007 along with Bulgaria, bringing the number of EU states to 27.

### ***Healthcare System***

With a population of 22.2 million inhabitants (RNIS 2016), Romania is the seventh most populous country of the European Union. Life expectancy is 75.47 years and the most frequent causes of death are similar to other European countries i.e. diseases of the circulatory system (ischemic heart disease, cerebrovascular diseases) and neoplasia (RNIS 2015).

Since 1989 the healthcare system has been transformed in parallel with the dramatic political changes. Until 1997 the Ministry of Health managed the healthcare system centrally; it was then decentralized and changed into a compulsory state health insurance model (Official Journal of Romania).

Membership of the European Union imposed new responsibilities regarding the integration of health systems. In January 2007 Romania started to implement the European Insurance Card for all inhabitants and in 2008, implemented an Integrated Information System for National Health Insurance (CNAS 2016). The National Health insurance system accounts for 3.9% of gross domestic product, and funds 527 hospitals (362 public and 161 private) amounting to 130,963 beds. There are also 931 outpatient departments, polyclinics and dispensaries (55% of which are public) and 795 general practices. In 2015 there were 54,929 physicians (27.6/10000 inhabitants) and 115,762 qualified nurses (58.13/10000 inhabitants) (RNIS 2015).

### ***Higher Education in Romania***

The political changes in the country have led to a reconsideration of higher education which had formerly been aligned to Soviet models. Consequently changes within Romanian higher education have been multiple, radical, and continuous. Since 1990, when the first private universities were set up in Romania, the number of universities and faculties, and also the number of programmes of studies/specialties, has increased rapidly. As a result of this diversification, Law no. 88/1993 was adopted, requiring the accreditation of higher education institutions and diploma recognition. In compliance with this law, the National Council for Academic Evaluation and Accreditation (CNEAA) was created, which, during 1993-2006, had the responsibility for evaluation and institutional and programme accreditation. (ARACIS 2016, Official Journal of Romania).

The evolution of the European Higher Education Area led inevitably to a new approach to quality assurance and evaluation so the Romanian Agency for Quality Assurance in Higher Education (ARACIS) was established in 2005. This is an autonomous national public institution, whose main mission is the external quality evaluation of the Romanian higher education at the level of study programmes, as well as the institutions. Since September 2009, ARACIS has been a full member of the European Association for Quality Assurance in Higher Education – ENQA and is registered in the European Quality Assurance Register for Higher Education - EQAR (ARACIS 2016).

The agency's main strategy could be described as: improving the external evaluation methodology (in full compliance with the European standards), increasing the role of students, creating a quality culture in the Romanian higher education, establishing a permanent partnership with all institutions in the national higher education system and with the economic-social environment, in order to align higher education with the labour market (ARACIS 2016).

In Romania, in the academic year 2014/2015, 541,653 students were enrolled in 101 institutions of tertiary education, with 583 faculties (public and private) and 27,772 teaching staff (RNIS 2015).

***Health specialties in the higher education system***

In Romania, in the field of health studies, formal regulation applies to five general specialties and eight specializations (Table 1). In the academic year 2014/2015, there were 68,230 learners enrolled for long- and short-term programmes of tertiary education in healthcare, in both public and private institutions.

<b>Field of science studies</b>	<b>Type of regulation</b>	<b>Specialities</b>
<b>HEALTH</b>	Sectorially regulated within the European Union	<ul style="list-style-type: none"> <li>• <b>Medicine</b></li> <li>• Dental Medicine</li> <li>• Pharmacy</li> <li>• Medical Assistance</li> <li>• Midwifery</li> </ul>
	Generally regulated	<ul style="list-style-type: none"> <li>• Radiology and MRI</li> <li>• Clinical laboratory</li> <li>• Balneo-kinetotherapy and recovery</li> <li>• Dental Technology</li> <li>• Dental assistance</li> <li>• Pharmacy Assistance</li> </ul>

		<ul style="list-style-type: none"> <li>• Audiology and hearing aids</li> <li>• Stomatological prophylaxis assistance</li> </ul>
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Table 1 Health specialties in the higher education system (sectorially and generally regulated)

### ***Faculties of Medicine in Romania***

At present, in Romania, thirteen different Faculties of Medicine (12 public schools and one private institution) offer opportunities to train as a doctor. Together with the traditional Medical Schools of Bucharest, Iași, Cluj-Napoca, Timișoara and Tîrgu Mureș, since 1990, eight other Faculties of Medicine have been developed and accredited and, as a real proof of international integration, 80% of them offer programmes of study in different foreign languages (English, French and Hungarian).

### **Medicine – Levels of Study**

#### ***Undergraduate Medical Education***

The undergraduate medical programme normally takes six years and is aligned with the European Credit Transfer and Accumulation System (ECTS) comprising a total of 360 ECTS. The ECTS means that transfer between medical schools is, at least theoretically, possible.

#### ***Admission Exam***

Admission to medical school in Romania involves an examination. The results of a paper (focusing mainly on Biology and Chemistry) set by the prospective host medical school are combined with the baccalaureate scores and the students are ranked. In the traditional faculties as Bucharest, Iași, Cluj Napoca, Timișoara, Tîrgu Mureș and Craiova, admission exams are run on the same day. The exams are set locally to meet the national standards set by ARACIS. The format of the papers differs between schools. In most schools the exams are based around

the national textbooks, but in Tîrgu Mureş, as an innovative element, there is also a locally produced set-text. The students are not interviewed individually, and acceptance into medical school is determined by the ranked scores of the candidates.

***The medical curriculum***

*Content and teaching methods.*

The mandatory courses/disciplines in the curriculum for the Medicine programme of study are similar to those in the rest of Europe and are imposed by ARACIS – (Table 2), but each University of Medicine and Pharmacy has some autonomy to allow them to develop their curricula to train doctors with strong theoretical and clinical competence appropriate to local expertise and the needs of the community served by the medical school.

At present the curriculum in Romanian Medical Schools follows the traditional pre-clinical/clinical pattern. In the preclinical phase (normally the first three years), students attend lectures and practicals, to focus on theoretical and fundamental concepts. In the clinical stage (year 4 onwards) the students attend lectures but they are also involved daily (3-4 hours/day) in the practical activity of different clinics, by rotation (internships are correlated with subject of the semester, all students being split in small groups of 8-12 persons). In common with all European Union Countries, in Romania, the minimum number of teaching hours in Medical Schools is 5500 which is regulated by ARACIS.

<b>Fundamental Disciplines</b>	<b>Specialty Disciplines</b>	<b>Complementary Disciplines</b>
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Anatomy	Medical and Surgery	Behavioural Sciences
Biochemistry	Semiology	Medical Psychology
Biophysics	Internal Medicine	Medical Sociology
Physiology	Clinical Biochemistry	Medical Informatics and
Cellular and Molecular Biology	Immunology	Biostatistics
Bacteriology.Virology.	Respiratory Medicine	Medical Communication
Parasitology	Rheumatology	Research Methodology
Pathology	Medical Rehabilitation	Physical Education
Pathophysiology	Neurology	Foreign Languages
Clinical pharmacology	Psychiatry	
Histology	Pediatrics and Child Care	
Epidemiology	Endocrinology	
Genetics	Infectious Diseases	
Hygiene	Dermatology	
Medical ethics. Bioethics	Oncology	
	Family Medicine	
	Radiology	
	General Surgery	
	Paediatric Surgery	
	Plastic Surgery	
	Oral Maxillo Facial	
	Surgery	
	Orthopedics -	
	Traumatology.	
	Pediatric Orthopedics	

	ENT Ophthalmology Urology Intensive Care Obstetrics-Gynecology Neonatology Public Health. Health Management Primary Health Assistance Occupational Medicine. Emergency Medicine First Aid Forensic Medicine Practical Skills	
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*Table 2 Mandatory Curriculum Content for the Medicine Program of study (ARACIS 2016)*

*Assessment.*

Each year of study contains 28 weeks dedicated to formal study teaching and 6-8 weeks used for assessment, organized in two semesters (each of 30 ECTS) with the assessment periods in January/February and May/June. There are some exceptions in the clinical area, where in some centers they have modules of study, dedicated to a single topic, which are assessed at the end of each module. Practical skills are assessed in the clinical years in OSCEs and at the bedside, but by far the most commonly used system of assessing knowledge is the multiple choice question (MCQ) tests. In Romania, as in many other countries, medical educators are moving away from large numbers of formal lectures and practical classes and are working toward

increasing active learning and providing educational activities that extend beyond the core competencies. External regulation from ARACIS limits the scope of these developments.

### *Licensing Examination*

The licensing examination is organized independently by each Medical Faculty and represents a mixed final assessment. It comprises a theoretical test, a practical exam, and the presentation of a scientific paper. The passing of the local licensing exam offers the title of Doctor-Physician, but this is just an intermediary step for becoming a specialist doctor. The failure rate of the Licensing Exam is less than 10% and a student can repeat this exam up to three times in the five years after graduation.

### *Postgraduate Medical Education*

#### *The Residency System*

There is no postgraduate intern system, and recently qualified doctors move directly into specialty training. Medical and surgical specialties are chosen after passing a national residency exam (4 hours, 200 MCQs), 2 months after the licensing exam, organized simultaneously in the ten senior Medical Schools in Romania, using the same bibliography. Depending upon the complexity of the chosen specialty, the residency programme comprises a phase of 3-6 years of continuous preparation (3 years: Epidemiology, Hygiene. 4 Years: Family Medicine and most of medical specialties (gastroenterology, haematology, Nephrology etc.) 5 years: most of surgical specialties. 6 years: General Surgery, Neurosurgery, Cardiovascular Surgery, Cardiology). The curricula for the residency programmes are imposed nationally by the National Committees for each specialty, are approved and coordinated by the Ministry of Education and delivered by the Faculties of Medicine. At the end of this stage, the young doctor becomes a specialist in their chosen medical field after passing a complex exam

that tests both theoretical and practical abilities. After successfully passing the examinations, the specialist doctor can apply for a job in either a public or private medical institution.

### *Doctoral Program*

In Romania, in 12 Faculties of Medicine (Bucharest (2), Cluj-Napoca, Iași, Timișoara, Craiova, Tîrgu Mureș, Constanța, Brașov, Sibiu, Arad and Oradea) there are Doctoral Schools that offer opportunities and support for research training. The Doctoral program is not mandatory for the medical career, but it is a national request for physicians who want to become members of the University (to start an academic career). In Romania, the title of *Assistant* is obtained after graduation of the doctoral program. There are opportunities for doctoral grants, in order to support students (UEFISCDI). The average interval for finishing the research activity is 4 years.

### *Masters' Programmes*

The Masters' programmes offered by Universities of Medicine and Pharmacy in Romania, are not mandatory, but are followed by those who wish to specialize further. Regarding higher education as a whole, these postgraduate systems of study represent important steps for all programmes of study that follow the Bologna system. In the healthcare field this is particularly the case for nurses and physiotherapists. Even so, each University is developing a wider range of master's programmes. In Romania there are currently no possibilities for postgraduate education in the field of Medical Education.

### *Continuous Medical Education*

Continuous medical education (CME) is a legal requirement and represents a part of the wider concept of continuing professional development in the medical domain and consists in the

overall of activities of theoretical and practical training applied by physicians in order to maintain, update or enhance their level of knowledge, professional skills and attitudes, for a higher quality medical practice, warranting patient's safety. The Romanian College of Physicians manages (and validates) the CME activities through the National Program of Continuing Medical Education and all these activities are quantified by crediting units (CME credits): one hour of effective CME activity represents one EMC credit. All credits obtained by physicians as a result of attendance in CME activities (courses) contribute to the formation of physician's professional score that represents at least 200 credits/5 years or 40 credits/1 year. (CMR 2013).

### **Future Challenges for the Romanian Faculties of Medicine**

Although the educational process in Romanian Faculties of Medicine has evolved in recent years, with several collaborative projects funded by the European Union, the mandatory content of the curriculum imposes constraints in developing the curricula. All schools have been working towards meeting the standards set down by the World Federation for Medical Education, but there has been variable progress in moving away from the traditional didactic curriculum. In some schools there has been success in implementing clinical skills laboratories, but, again, the impact on undergraduate medical education has not been uniform across the country.

All faculties have been engaged in creating an adequate and supportive environment for learning, to offer complex explanations and strong motivation for students, offering feed-back and encouraging reflection on action for learners (Taylor and Hamdy 2013). In this manner, correctly identifying educational needs and guiding the students through the learning cycle, every teacher can develop the educational process. But also, students, as active learners, can

generate and solicit their own, sustainable, feedback (Boud and Molloy 2013). In this way the focus of feedback is directed towards encouraging students to be self-regulated learners.

All of these aspects have to be reflected in a programme of study in a Medical School. Any curriculum has to cover the key domains of the programme and the assessment needs to be aligned with defined skills (Tractenberg et al. 2010). The constructive alignment of course design elements is a crucial step in the design of any learning-centred course (Whetten 2007). As in the rest of the world, there is constant pressure to develop and refine the expected learning outcomes and adapt to the methods of learning teaching and assessment in the face of increasing public (and student) expectations. In Romanian Medical Schools, there is an undertaking towards new approaches, considering the curricular content, teaching methods and assessment. Change is challenging when the funding models and curricula are enshrined in law. The target, by 2030, is for all institutions to promote a student-centred system of teaching, in order to improve theoretical knowledge, practical abilities and communication skills.

Central to achieving these aims has been the implementation of programmes of training for faculty in key roles and students. Many of these were initially paid for from collaborative bids for European funding but are now internally funded by the individual schools.

In centres like Cluj-Napoca and Tîrgu Mureş, concrete steps have already been made to implement teaching methods of team-based learning (TBL) and case-based learning (CBL), emphasizing the value of small-group learning. Team-based learning (Parmelee et al., 2012) is a student-centred active learning method, the structured tasks being used in order to develop students thought processes through active individual experience and team collaboration (Robertson and Franchini 2014). CBL has been included as a relevant opportunity to form a

bridge between theory and practice, analysing data in order to reach a simple conclusion quickly and to develop analytic, communicative and collaborative skills alongside knowledge (Thistlethwaite et al., 2012). This means that the medical schools are reforming to comply with the World Federation of Medical Education Standards (2012).

To develop practical skills, medical students need a large number of hours of bedside teaching, and internships with a large involvement in clinical areas. Achieving this requires good administration, clinical infrastructure and human resources (teachers and patients). To ease the pressures, simulation (Issenberg et al., 2005; Gaba, 2000) has become a significant element of medical education over the past few years in Romania. At least five factors contribute to the rise of simulation in medical education (Issenberg et al., 2005): problems with clinical teaching; new technologies for diagnosis and management; assessing professional competence; medical errors, patient safety and team training; and the role of deliberate practice. The integration of high-fidelity simulators in the curriculum allows the students to be involved in repetitive practice, to acquire practical skills and to shorten the learning curves. All these can be developed not only for medical students, but also during the postgraduate training for continuous personal development. In centres such as Cluj Napoca, Tîrgu Mureş and Bucharest, Romanian students have access to Simulation Centres focused both on basic skills and advanced medical simulation.

It is important to align assessment not only with immediate learning requirements, but with long-term learning (Boud & Falchikov, 2006). The development of learning outcomes and their assessment is complex but necessary. Currently all medical schools use MCQs to test theoretical knowledge and case presentations in clinical topics. The next stage is to develop measures of clinical acumen, including, but not limited to, objective structured clinical

examinations (OSCEs). This will mean radical development of, and investment in, the assessment teams (Grantz et al., 2013), including developing question banks, examiner training, the training of standardised patients and the enhancement of quality assurance processes.

An important challenge for all Romanian Faculties of Medicine is to provide qualitative and quantitative adapted humans and material resources for the future. It will be necessary an optimum selection of teachers and students, quantitative adaptation of teaching staff for the students' number, continuous training for teachers but also the creation or development of Medical Education Departments in each Faculty of Medicine, with national and international collaborations. Each of the medical schools in Romania are addressing this through discussions, training programmes and conferences (both local and national), including not only the staff, but also students – notably a series of medical education training days in Timișoara which has led to the development of a training programme for student mentors (Taylor et al., 2014).

Becoming a doctor does not demand only obtaining practical skills and theoretical information, but also involves the integration of the graduate in the healthcare system. Learning and thinking are social activities (Durning & Artino 2011) and should be “located” within the larger physical and social context of the environment. The role of the context and the community are crucial, because the experience of the medical student is shaped by them. The mentor or coach from within the academic community, guides all students in their meaningful involvement in activities, but the partnerships between faculties with local public and private institutions also play an important role in offering a high level of education. In the face of such major changes in medical education, internal development is essential, but this must also be sustained through

external partnerships. This means institutions not only competing, but also collaborating, to gain funds to develop their infrastructure and teaching staff. The teachers' and students' mobility, experience and expectations should be sustained by participating in the European program Erasmus<sup>+</sup> and by continuing to invest in exchanges between universities nationally and internationally.

## **Conclusions**

In Romania, in parallel with political changes and after 1990, there have been many positive changes in both the healthcare system and higher education. In all thirteen Faculties of Medicine, students from Romania and all over the world find opportunities to study in four different teaching languages, in long-term and short-term programs, with concrete possibilities to continue their preparation and research as doctoral students or in study at master's level.

The process of the curricular reform in the Romanian Faculties of Medicine, in a system still coordinated by rigid national rules, is a complex process that needs consequence and continuity, involving important human and material resources. The expected learning outcomes, the methods of teaching and learning and the assessment procedures integrated in the new courses/programs design for the Romanian Faculties of Medicine have to be shaped by progress in medicine, changes in healthcare delivery, public expectations, new approaches in education, developments in educational technology and changes in the European space.

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