BENCHMARK

AQU CATALUNYA

SUBJECT BENCHMARK STATEMENT: MEDICINE

Guidelines for Curriculum Design

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CONTENTS

INTRODUCTION AND OBJECTIVES

The Catalan University System's (SUC) adherence to the European Higher Education Area (EHEA) entails a number of commitments, including the implementation of a coherent internal and external quality assurance system for the provision of higher education. Since 2010, and in accordance with the European context and current legislation, AQU Catalunya has applied the VSMA Framework[1] for the verification of new teaching proposals, monitoring of their implementation, evaluation of any modifications they may undergo, and cyclical accreditation of study programmes.

In 2025, the *Framework for Improving the Institutional Quality of the Catalan University System* (QUALINS Framework) [2] was approved. This framework envisages the use of programme reference documents to facilitate the design and evaluation of study programmes. The use of these reference documents enables self-verification processes, provided that certain criteria aligned with common practice in the EHEA are met.

This document is part of the QUALINS Framework and aims to guide universities in the design and evaluation of new degree programmes in the field of Medicine. It has been developed in accordance with the guidelines of the *Framework for Qualifications of Higher Education in Catalonia*[3] for level 3 (Master's degree).

Subject benchmark statements

Subject benchmark statements describe the elements that give a discipline or field of knowledge its coherence and identity. To this end, they define the nature and characteristics of academic degrees in the field and outline what can be expected of graduates upon completion of their studies.

Aims

[1] Agència per a la Qualitat del Sistema Universitari de Catalunya. *Marco para la verificación, el seguimiento, la modificación y la acreditación de los títulos oficiales (Framework for the verification, monitoring, modification and accreditation of official degree programmes).* 2nd ed. AQU Catalunya, 2016. https://www.aqu.cat/doc/Universitats/Metodologia/Marco-para-la-verificacion-el-seguimiento-la-modificacion-y-la-acreditacion-de-los-titulos-oficiales.

[2] Huertas-Hidalgo, Esther, Albert Basart-Capmany, Josep Manel Torres-Solà, and Jaume Valls-Pasola. *Marco para la mejora de la calidad institucional del sistema universitario catalán (Framework for the improvement of the institutional quality of the Catalan university system)*. 1st ed. Agència per a la Qualitat del Sistema Universitari de Catalunya, 2025. https://www.aqu.cat/es/doc/Universitats/Metodologia/Marco-para-la-mejora-de-la-calidad-institucional-del-sistema-universitario-catalan-2025.

[3] Rauret, Gemma, Sebastián Rodríguez, Nick Harris, et al. *Marco catalán de cualificaciones para la educación superior (Catalonian framework for qualifications in higher education) 2nd ed.* 2nd ed. AQU Catalunya, 2023. https://www.aqu.cat/es/doc/Universitats/Metodologia/Marco-catalan-de-cualificaciones-para-la-educacion-superior-2023.

The Subject Benchmark Statement for Medicine specifies these aspects for the official *Bachelor's Degree in Medicine*. Graduate training expectations are expressed in terms of learning outcomes, grouped into knowledge, skills and competencies. The document also incorporates elements and common practices to be considered when designing and delivering the curricula for these degrees.

Uses

This document may be used by a range of stakeholders for different purposes, including the following:

- The design, modification and implementation of new curricula by the management teams of university faculties or schools.
- The verification, monitoring, modification and accreditation of degree programmes by quality assurance agencies.
- The provision of information to society, particularly prospective students and employers, regarding the characteristics of the degree and its intended learning outcomes.

Under no circumstances is this reference document mandatory, nor does it seek to establish a common curriculum at all university institutions or to prescribe specific teaching, learning or assessment approaches. Its purpose is rather to support universities in the design and evaluation of Medicine degrees, enabling institutions to adapt the aspects addressed in the document to their own context and educational objectives.

The regulatory framework

In general, university degrees in Catalonia and Spain are subject to legal regulations governing their key characteristics. The most important are:

- Organic Act 2/2023, of 22 March, on the University System. Official State Gazette (70), 2023, pgs. 43267–43339. BOE-A-2023-7500.
- Royal Decree 822/2021, of 28 September, establishing the organisation of university studies and the procedure for quality assurance. Official State Gazette (233), 2021, pgs. 119537–119578. BOE-A-2021-15781
- Royal Decree 1027/2011, of 15 July, establishing the Spanish Framework for Qualifications for Higher Education. Official State Gazette (185), 2011, pgs. 87912–87918. BOE-A-2011-13317

Regulation of the medical profession

The medical profession is regulated at the European Union level by Directive 2005/36/EC of

the European Parliament and of the Council. [4] This Directive establishes the conditions under which a Member State recognises professional qualifications obtained in one or more other Member States, thereby enabling the holder of those qualifications to practise the same profession in its territory. To ensure effective recognition, the Directive sets out a series of common minimum criteria that professional qualifications within the European Union must fulfil.

With regard to the medical profession, the Directive distinguishes between two types of training: basic medical training (BMT), acquired in Spain through the Bachelor's Degree in Medicine, and specialised medical training (SMT), undertaken by graduates who gain access to the Specialist Health Training programme of the Ministry of Health and are appointed as Resident Physicians (*Médico Interno Residente*, MIR). The Reference Document for the Bachelor's Degree in Medicine addresses only basic medical training.

The Spanish state transposes the European Directive through two legal instruments:

- A Council of Ministers Agreement establishing the conditions with which study plans leading to degrees that enable the practice of the regulated profession of Doctor must comply. [5]
- Order ECI/332/2008 of 13 February, which establishes the requirements for the verification of official university degrees enabling the practice of the profession of Doctor. [6]This Order is particularly significant, as it defines the competencies that graduates of the *Bachelor's Degree in Medicine* must acquire, determines the curricular structure of the degree, and specifies the competencies and ECTS credits assigned to each module.

In addition, healthcare professions in Spain are regulated by Law 44/2003. [7] This law identifies the healthcare professions, sets out the training requirements and conditions for professional practice, regulates continuing professional development, and establishes the accreditation procedures for teaching centres and units.

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[4] Parlamento Europeo y Consejo, 'Directiva 2005/36/CE del Parlamento Europeo y del Consejo, de 7 de septiembre de 2005, relativa al reconocimiento de cualificaciones profesionales (Texto pertinente a efectos del EEE)', Diario Oficial de la Unión Europea L 255, de 30 de septiembre de 2005, p. 22.

[5] Ministerio de Educación y Ciencia, 'Resolución de 17 de diciembre de 2007, de la Secretaría de Estado de Universidades e Investigación, por la que se publica el Acuerdo de Consejo de Ministros de 14 de diciembre de 2007, por el que se establecen las condiciones a las que deberán adecuarse los planes de estudios conducentes a la obtención de títulos que habiliten para el ejercicio de la profesión regulada de Médico', Boletín Oficial del Estado (305), de 21 de diciembre de 2007, pág. 52849-52850. BOE-A-2007-22015.

[6] Ministerio de Educación y Ciencia, 'Orden ECI/332/2008, de 13 de febrero, por la que se establecen los requisitos para la verificación de los títulos universitarios oficiales que habiliten para el ejercicio de la profesión de Médico'. Boletín Oficial del Estado (40), de 15 de febrero de 2008, pág. 8351-8355. BOE-A-2008-2674.

[7] Head of State. Act 44/2003, of 21 November, on the regulation of healthcare profession, Official Spanish Gazette (280), 22 November 2003, pp. 41442-41458. BOE-A-2003-21340 41442 (2003). https://www.boe.es/eli/es/l/2003/11/21/44.

In accordance with European regulations and the Spanish Qualifications Framework for Higher Education (MECES),[8] as established by Royal Decree 1027/2011, the *Bachelor's Degree in Medicine* is classified at level 3 (EQF level 7, equivalent to a Master's degree). This classification reflects the programme's structure of six academic years and a total of 360 ECTS credits.

Table 1 shows the stages of the training pathway leading to access to the medical profession in Catalonia and Spain. [9]

Table 1. Phases in the training of a doctor.

	Phase	Training and professional practice	Duration of studies
	Phase I	Basic medical training	6 years
	Phase II	MIR examination and access to specialist training	
	Phase III	MIR training and acquisition of specialist competencies	4–5 years
	Phase IV	Professional practice	

Recent work and debates in Catalonia

Conclusions of the Professional Dialogue Forum [10]

In 2019, the Department of Health of the Government of Catalonia convened a professional dialogue forum, bringing together professional associations from all healthcare professions, patient organisations, scientific societies, healthcare providers, trade unions, educational institutions, and government departments and bodies. Seventy-one organisations participated in total. The forum established 15 working groups, which identified 17

[8] Article 7.4: 'Bachelor's degrees that, by virtue of European Union regulatory requirements, comprise at least 300 ECTS credits, provided they include a minimum of 60 ECTS credits that meet the characteristics of the descriptors set out in section 2 of this provision, may be classified at Level 3 (Master's) under this Royal Decree. The regulations on the organisation of official university education shall establish the procedure to be followed to obtain such classification.'

[9] José María Rodríguez-Vicente, Virginia Izura-Azanza, Vicente Matas-Aguilera, María Antonia Muncharaz and Ignacio Morán. *Medical demographics survey - 2025*. CGCOM notebooks. Organización Médica Colegial y Consejo General de Colegios Oficiales de Médicos, 2025. https://www.cgcom.es/sites/main/files/2025-10/ESTUDIO_DEMOGRAFÍA_MÉDICA_2025/170/index.html.

[10] Direcció General de Professionals de la Salut, 'Fòrum de diàleg professional. Conclusions' (Barcelona: Generalitat de Catalunya. Departament de Salut, 2019).

professional challenges facing the Catalan healthcare system. Several of these challenges, to be addressed through shared responsibility with other organisations and institutions, fall directly within the remit of the Catalan University System.

The final document sets out a series of challenges relating to medical education, including the following:

- *Challenge 4.1:* Developing training content grounded in the definition and framework of general competencies for healthcare professionals, as agreed by the working group. These encompass collaborative and participatory practice; communication and digital reputation; research, creativity and innovation; data management and analytics; change management; digital awareness; and information management.
- *Challenge 4.2:* Implementing training pathways that incorporate the training, assessment and accreditation of professional competencies for healthcare professionals.
- *Challenge 5.2:* Planning undergraduate and master's-level curricula on the basis of healthcare needs identified by the Department of Health, contributions from professional associations and prospective analyses of scientific advances. Specifically, this entails:
    - Incorporating cross-cutting themes such as gender perspective, clinical safety, quality of care, big data, and new information and communication technologies (ICTs) relevant to professional practice.
    - Ensuring the inclusion of humanistic values; communication skills; clinical management; multidisciplinary teamwork; foundational training in scientific research; legal, deontological and ethical aspects closely linked to clinical practice; self-directed learning; and elements of global health.
- *Challenge 5.3:* Identifying the principal training gaps for each profession. In undergraduate medical education, this includes the need to incorporate activities and scenarios involving multidisciplinary teams, and to ensure that students become familiar with the basic action protocols of the Catalan healthcare system.
- *Challenge 5.4:* Reviewing the map of healthcare centres, in terms of both quantity and quality, to ensure adequate teaching capacity for educating the students and healthcare professionals required in Catalonia. For undergraduate training, this challenge includes integrating new technologies, such as simulation and virtual reality tools, simulated patients, video resources and simulated clinical scenarios, into curricula.
- *Challenge 6:* Explicitly embedding training in common and profession-specific values and attitudes within degree programmes, to ensure a high-quality healthcare model

for the citizens of Catalonia. This challenge is elaborated through the following actions:

- 6.1. Consolidating and implementing a proposal for professional and humanistic values.
- 6.2. Designing a strategy for the acquisition of humanistic values across different curricula.
- 6.3. Integrating values into curricular requirements.
- 6.4. Transforming clinical placements and simulations into learning scenarios that foster the acquisition of values through modelling and reflection.
- 6.7. Promoting the acquisition of competencies that enable effective interpersonal relationships and communication.
- 6.8. Supporting students in developing skills related to reflective practice.
- 6.9. Introducing creative expression strategies to stimulate reflective capacity and the development of non-technical skills.

— *Challenge 9.1:* Consolidating and implementing the proposal agreed by the working group on expected behaviours for resident physicians, as an expression of the principles and values that guide professional practice. These principles and values, the person-centred care, respect for patient autonomy, honesty, social justice and professional commitment, are equally applicable to undergraduate medical education.

— *Challenge 17.1*: Strengthening the presence of family and community medicine within undergraduate medical education at Catalan universities.

These challenges have been identified by the principal employers of medical graduates as critical to the future of clinical practice in the near term. [11] In particular, employers emphasise the importance of new technologies (such as telemedicine and artificial intelligence), communication and empathy, teamwork and shared decision-making, and efficient resource management.

All of these elements have been considered and incorporated into this reference document. The inclusion of defined medical roles, entrustable professional activities, objective structured clinical examinations (OSCEs), and the explicit formulation of learning outcomes,

[11] Nieto-Viramontes, Sandra. *L'opinió del col·lectiu ocupador sobre la formació dels Metges Interns Residents (MIR) (The Opinion of Employers on the Training of Resident Physicians [MIR])* With Martí Casadesús-Fa and Anna Prades-Nebot. Agència per a la Qualitat del Sistema Universitari de Catalunya, 2020. https://www.aqu.cat/content/download/10657/file/L%27opini%C3%B3%20del%20col%C2%B7lectiu%20ocupador%20sobre%20la%20formaci%C3%B3%20dels%20Metges%20Interns%20Residents%20%28MIR%29.pdf?inLanguage=cat-ES&version=12.

for example, is intended to respond to these challenges and to address the need to update curricula and training profiles originally established 19 years ago.

Additional reference documents

When designing, implementing and reviewing degree programmes in this field, it is also advisable to consider the following reference documents:

- Gemma Rauret, Sebastián Rodríguez, Nick Harris, Bruno Curvale, Lluís Jofre, Miquel Mirambell, Marta Nel·lo, and Josep Manel Torres, *Marc català de qualificacions per a l'educació superior (Catalonian framework for qualifications in higher education)* (Barcelona: AQU Catalunya, 2019).
- Agència per a la Qualitat del Sistema Universitari de Catalunya, *Estàndards i criteris per a l'avaluació de la qualitat de graus i màsters universitaris (Standards and criteria for the evaluation of quality in Bachelor's and Master's degrees)* (Barcelona: AQU Catalunya, 2022).

The following international reference documents relevant to this field of knowledge may also be considered:

- Jason R. Frank, Linda Snell, and Jonathan Sherbino, eds. *CanMEDS 2015 Physician Competency Framework*. Ottawa, ON, Canada: Royal College of Physicians and Surgeons of Canada, 2015.
- Wayne Weston, Maria Hubinette, and Kathleen Horrey. *CanMEDS-FMU 2019: Undergraduate Competencies from a Family Medicine Perspective*. Mississauga, ON, Canada: The College of Family Physicians of Canada, 2019.
- Brent Thoma, Anna Karwowska, Louise Samson, Nicole Labine, Heather Waters, Meredith Giuliani, Teresa M Chan, et al. «Emerging concepts in the CanMEDS physician competency framework». *Canadian Medical Education Journal*, 26 September 2022.
- NFU Netherlands Federation of University Medical Centres. "Medical Training Framework 2020". Utrecht, the Netherlands: NFU, May 2020.
- Pierre-André Michaud, Patrick Jucker-Kupper, Werner Bauer, Christoph Berendonk, Jocelyne Bloch, Nadine Facchinetti, Catherine Gasser, et al. "Principal Relevant Objectives and Framework for Integrated Learning and Education in Switzerland (PROFILES)". Bern, Switzerland: Joint Commission of the Swiss Medical Schools (SMIFK/CIMS), 15 March 2017.
- General Medical Council (GMC). "Outcomes for Graduates". London, UK: GMC, November 2020.
- Australian Medical Council Limited. *Standards for Assessment and Accreditation of Primary Medical Programs*. Kingston ACT, Australia: AMC, 2024.
- Association of American Medical Colleges. "Foundational Competencies for Undergraduate Medical Education". Washington, D.C.: AAMC, 2023.

- Danish Health and Medicines Authority. *The Seven Roles of Physicians*. 2nd edition. Copenhagen, Denmark: Sundhedsstyrelsen, 2014.
- World Federation for Medical Education. “Basic Medical Education. WFME Global Standards For Quality Improvement”. WFME, 2020. https://wfme.org/wp-content/uploads/2020/12/WFME-BME-Standards-2020.pdf.

REFERENCE LEVELS

The reference levels or descriptors set out below correspond to those established in the *Framework for Qualifications of Higher Education in Catalonia* (MCQES), [3]which is based on the *Spanish Framework for Qualifications for Higher Education* (MECES). [12] These descriptors apply to the different levels of higher education (in this case, the integrated bachelor's degree) and are not defined for specific degree programmes.

Within the MCQES, qualification levels are defined primarily according to two Within the MCQES, qualification levels are defined primarily according to two dimensions: (a) the breadth, depth, integration and capacity for application of the knowledge acquired; and (b) the level of mastery of skills and competencies.

Levels are expressed in terms of learning outcomes that all graduates at a given level are expected to have achieved. These learning outcomes are grouped into three categories: knowledge, skills and competencies:

- **Knowledge**: the outcome of the assimilation of information through learning. Knowledge comprises the body of facts, principles, theories and practices related to a field of work or study. Within the MCQES, knowledge is described as theoretical or factual.
- **Skills**: the ability to apply knowledge and use it to complete tasks and solve problems. In the context of the qualifications framework, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments).
- **Competencies**: a demonstrated ability that integrates knowledge, skills, values and attitudes, enabling individuals to carry out professional activities in authentic contexts in an appropriate, well-founded manner, and oriented towards both processes and outcomes.

Integrated bachelor's degrees

Bachelor's Degrees in Medicine are positioned at level 3 of the MCQES, equivalent to level 3 of MECES, which corresponds to level 7 of the European Qualifications Framework (EQF) [13]

[12] Real Decreto 1027/2011, de 15 de julio, por el que se establece el Marco Español de Cualificaciones para la Educación Superior. (*Royal Decree 1027/2011, of 15 July, establishing the Spanish Framework for Qualifications for Higher Education*). Official Spanish Gazette (185), 2011, pgs. 87912–87918 87912 (2011). BOE-A-2011-13317. https://www.boe.es/eli/es/rd/2011/07/15/1027/con.

[13] Recomendación del Parlamento Europeo y del Consejo, de 23 de abril de 2008, relativa a la creación del Marco Europeo de Cualificaciones para el aprendizaje permanente (*Recommendation of the European Parliament and of the Council of 23 April 2008 on the establishment of the European Qualifications Framework*

and to the second cycle of the Qualifications Framework of the European Higher Education Area (QF-EHEA).[14] Table 2 presents the descriptors for level 3 (integrated bachelor's degrees).

Table 2. Descriptors for Level 3: Integrated bachelor's degrees

Objective	**Graduates at this level must have specialised knowledge and skills for research, professional practice or further learning.**
Knowledge	At this level, graduates must: • have acquired advanced knowledge and demonstrated, in the context of scientific and technological research or in a highly specialised field, a detailed and well-informed understanding of the theoretical and practical aspects of methodology and work in one or more fields of study.
Skills	At this level, graduates must: • be able to apply and integrate their knowledge and understanding with strong scientific and problem-solving skills in new and loosely defined environments, such as multidisciplinary contexts, both for researchers and highly qualified professionals; • be able to evaluate and select appropriate scientific theories and specific methodologies from their fields of study to formulate judgements based on incomplete or limited information, including, where appropriate, reflection on the social and ethical responsibilities associated with the proposed solutions in each case; • be able to anticipate and manage the evolution of complex situations through the development of new and innovative working methodologies adapted to the specific scientific, technological or research field, typically multidisciplinary, in which the activity takes place.
Competencies	At this level, graduates must: • be able to communicate clearly and unambiguously to both specialised and non-specialised audiences, scientific and technological results or the scope and most significant outcomes of the most innovative advanced research, based on fundamental principles; • have developed sufficient autonomy to participate in research projects and in scientific and technological collaborations within their field, in interdisciplinary contexts and, where applicable, with a strong component of knowledge transfer; • be able to take responsibility for their own professional development and specialisation in one or more fields of study.

for lifelong learning) (Text with EEA relevance), 2008/C 111/01, OJ C 111, 6.5.2008, pgs. 1–7. https://eur-lex.europa.eu/legal-content/ES/TXT/?uri=CELEX:32008H0506(01).

[14] EHEA Ministerial Conference. «The Framework of Qualifications for the European Higher Education Area». EHEA, 24 de maig de 2018. http://www.ehea.info/Upload/document/ministerial_declarations/EHEAParis2018_Communique_AppendixIII_952778.pdf.

In the MCQES, qualifications at this level are referred to as *integrated bachelor's degrees* and are aligned with master's-level outcomes. They are designed to enable students to become independent, versatile and highly qualified graduates, equipped with research experience, information literacy, and interpersonal and communication skills. These competencies prepare graduates either to pursue an advanced-level professional career or to undertake doctoral studies at a later stage.

NATURE AND SCOPE OF MEDICAL STUDIES

A wide range of sources and studies on medical education have been considered in defining the learning outcomes and other key characteristics of medical degree programmes. These include, first, the European and Spanish regulatory frameworks governing medical training. In addition, the document draws on initiatives from Canada, Switzerland and the Netherlands that define the professional competencies to be acquired by medical practitioners throughout their careers, within a continuum of education extending from entry into medical school to retirement.

The work of international organisations and associations in the field of medical education has also been considered, notably that of the Association of American Medical Colleges (AAMC), particularly in relation to Entrustable Professional Activities (EPAs), as well as contributions from the International Association for Health Professions Education (AMEE) and the World Federation for Medical Education (WFME).

Context

Provision in Catalonia

In the 2025–2026 academic year, a total of 1,340 first-year places were offered in Bachelor's Degrees in Medicine in Catalonia, distributed across eight universities and nine campuses, two of which are at the University of Barcelona (UB). This provision represents 2% of all bachelor's degree places within the Catalan University System (SUC) and 9.2% of those in the field of Health Sciences. First-choice demand is approximately four times higher than the number of places offered.

In the 2026–2027 academic year, two additional private universities will join this provision: Universitat Ramon Llull (URL), offering 120 places, and Universitat Abat Oliba CEU (UAO-CEU), with 50 places.

Table 3 presents data on the number of places offered, demand and enrolment for the 2023–2024 academic year, the most recent year with complete data, as well as trends since 2010.

With regard to admission grades (first allocation in June), Medicine (public universities and UVic-UCC) consistently ranks well above the median for Health Sciences degrees and is even higher when compared with all bachelor's degrees in the SUC. Figure 1 illustrates the evolution of admission grades since the 2010–2011 academic year.

Medical studies are highly feminised, with women accounting for 69% of enrolled students, a proportion above the average for the Catalan university system.

In summary, Bachelor's Degrees in Medicine are characterised by one of the most selective and high-quality admission processes within the Catalan University System.

Table 3. Trends in places offered, demand and enrolment in Bachelor's Degrees in Medicine (2023–2024).

Universitat	Oferta	Evolución oferta	Demanda	Evolución demanda	Nuevo Acceso	Evolución matrícula
UB (BCN)	200	259 200	1.569	1,8k 1,5k	196	254 196
UB (L'H)	100	87 100	262	474 295	104	85 104
UAB	385	320 385	955	729 1k	386	308 386
UPF	64	50 64	545	392 416	66	55 66
UdL	132	120 132	509	563 447	126	122 126
URV	137	125 130	626	705 745	142	118 142
UdG	92	80 92	261	266 304	90	85 90
UVic-UCC	115	80 115	161	134 124	136	84 136
UIC	115	80 115			110	96 110
UPF/UAB		60 60		336 476		53 0
Total	1.340	1k 1,3k	4.888	4,4k 4,8k	1.356	1k 1,4k

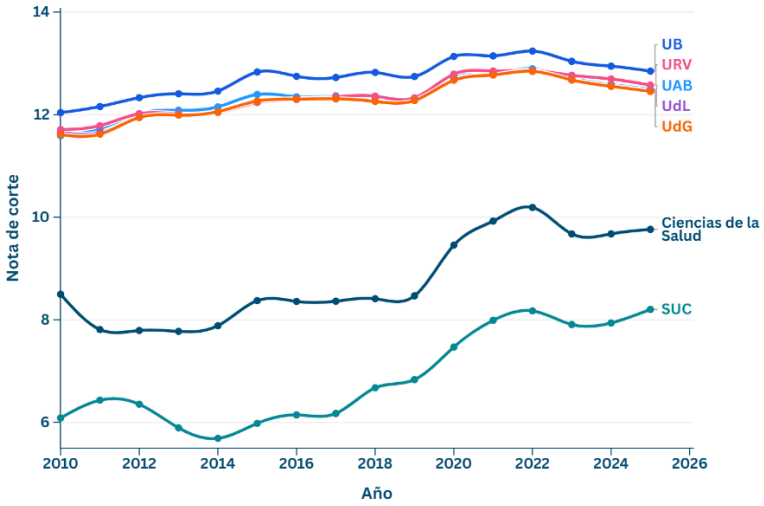

Figure 1. Evolution of entry grades for Bachelor's Degrees in Medicine (2010–2025).

Graduation

In the 2023–2024 academic year, a total of 6,432 students were enrolled in Bachelor's Degrees in Medicine, of whom 933 completed their studies. The overall graduation rate was approximately 70%. The university with the highest number of graduates was the Autonomous University of Barcelona (UAB), with 265 graduates, followed by the University of Barcelona (UB), with 243.

Table 4 presents data on enrolment, success rates and graduation outcomes for the 2023–2024 academic year, as well as trends since the 2010–2011 academic year.

Table 4. Evolution of enrolment, success rate and graduation.

Universitat	Matícula total	Evolución matrícula	Tasa de éxito	Evolución tasa éxito	Graduados/as	Evolución graduación
UB	991	254 991	0,98	0,97 0,98	165	0 165
UB	508	85 508	0,98	0,93 0,98	78	0 78
UAB	1.879	308 1,9k	0,95	0,90 0,95	265	0 265
UPF	167	55 167		0,93 0,92	0	0 0
UdL	572	127 572	0,98	0,90 0,98	77	0 77
URV	714	122 714	0,98	0,96 0,98	117	0 117
UdG	503	85 503	0,98	0,98 0,98	80	0 80
UVic-UCC	506	84 506	0,96	0,91 0,96	65	0 65
UIC	592	247 592	0,96	0,95 0,96	86	62 86
UPF/UAB		57 298		0,94 0,95		0 64
Total	6.432	1,2k 6,4k	0,97	0,94 0,97	933	0 933

Regarding the average grades of graduates, it can be observed that graduates in Medicine achieve higher grades than graduates from other programmes within the Catalan University System (SUC), including those in the field of Health Sciences. However, in this case the differences are considerably smaller than those observed at the point of entry (admission grades). Figure 2 illustrates the evolution of average graduation grades.

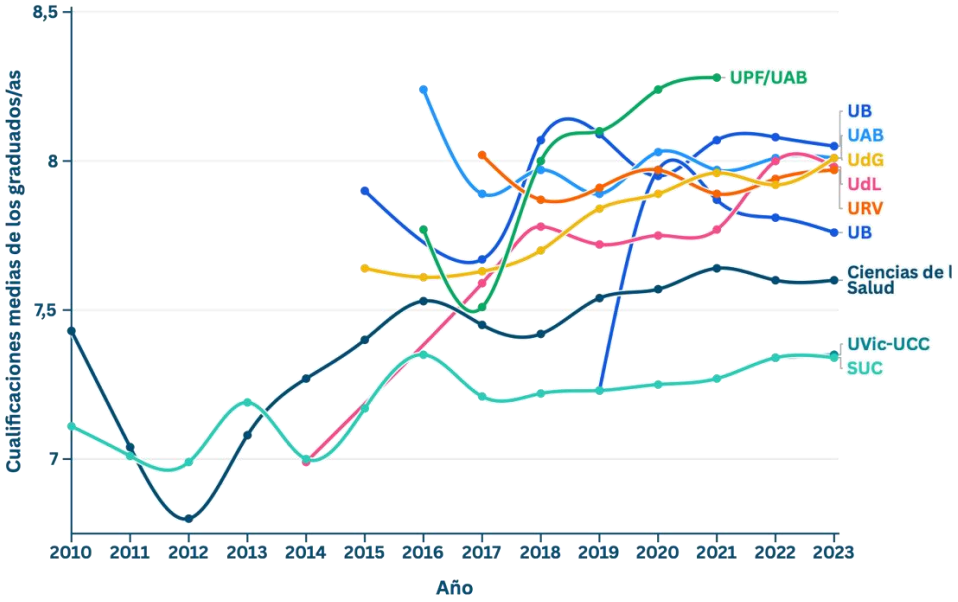

Figure 2. Evolution of the average grades of graduates in Bachelor's Degrees in Medicine (2010–2023).

The evolution of Medicine: Challenges for medical education

Medical practice and the discipline of Medicine have undergone substantial changes since the regulations governing the current curricula were established. Contemporary societies are increasingly diverse and complex, giving rise to major challenges for healthcare systems and patient care.

Firstly, significant demographic changes have occurred within the Catalan population. Over the past 25 years, the population has increased by 32%, from 6,174,547 inhabitants in 2000 to 8,154,627 in July 2025. [15] Immigration has been a decisive factor in this growth. Currently, 18% of the Catalan population (1,444,192 people) is of foreign origin and highly diverse: 31% are European, 29% South or Central American, 23% African and 13% Asian. [16]

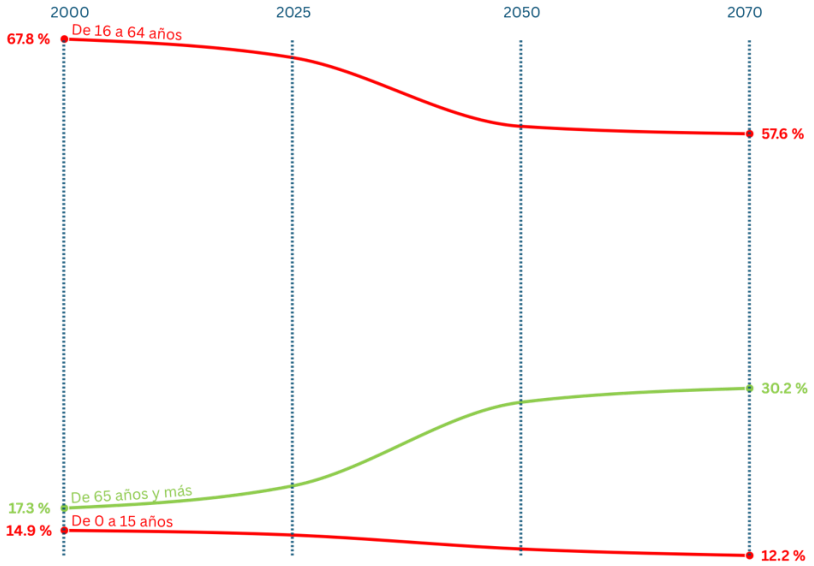

Figure 3. Evolution and projection of the Catalan population by age groups (2020–2070).

In addition, the population is ageing as a result of a sustained natural decrease. Since 2017, the natural population growth rate has ranged from –0.4% to –1.7% annually, reaching a minimum of –2.8% in 2020 as a consequence of the COVID-19 pandemic. [17] In 2025, people aged 65 and over account for 20% of the population, and even the most moderate projections estimate that this figure will rise to 29% by 2050 and 30% by 2070 (Figure 3). Moreover, 6% of the population is aged 80 or over, compared with only 1.8% in 2000, an increase of 340%.

Population ageing is associated with an increasing burden of non-communicable diseases (NCDs), greater susceptibility to acute clinical conditions, such as pneumonia, urinary tract

[15] Institut d'Estadística de Catalunya. Població per sexe (Population by Sex), IDESCAT (4.11.2025).

[16] Institut d'Estadística de Catalunya. Población extranjera a 1 de enero de 2024 por continentes (Foreign Population as of 1 January 2024 by Continent), IDESCAT (27/02/2025)

[17] Institut d'Estadística de Catalunya. Crecimiento natural de la población (Natural Population Growth), IDESCAT (02.12.2024).

infections, and acute coronary syndromes, and rising levels of multimorbidity. Consequently, the healthcare needs associated with demographic ageing are not confined to a limited number of medical specialties. As a result, collaboration and teamwork with other healthcare professionals and across different care settings are increasingly essential. From the perspective of the population served, the main challenges for medical practice therefore include population growth, cultural and socio-economic diversity, and ageing. These challenges are reflected in the views of the principal employers of medical graduates, who identify geriatrics, family medicine, anaesthesiology, neurology and oncology, specialties closely linked to population ageing, as the most relevant medical fields in the coming years.[11]

Secondly, medical practice itself is being transformed by both scientific advances and the technological developments associated with them. Today, doctors work in a highly technological environment, characterised by advanced diagnostic imaging, genetic and biological testing, robotics, artificial intelligence and big data, omics data, digitisation, eHealth and telemedicine, among others. These technological developments are designed to support medical professionals in their practice. The appropriate use of technology may contribute to optimising and expediting care pathways, thereby potentially reinforcing the doctor–patient relationship, an area that is presently under considerable pressure and warrants priority attention within medical education and training.

As a consequence, the doctor–patient relationship is also evolving. The population is becoming increasingly health-literate, 57.5% of the Catalan population aged between 25 and 34 have completed higher education[18], and shared decision-making is playing an increasingly prominent role in clinical practice[19].

Broader societal changes are also reflected within the medical profession itself. In 2025, 25.7% of doctors registered in Catalonia are of foreign origin, the average age of doctors is 51[20], and 34% are aged over 55.[9]

Medical education must consider all these changes. At the same time, it is evident that current training programmes cannot anticipate all future developments and advances in Medicine. It is therefore essential that medical education promotes learning outcomes that enable graduates to engage in lifelong learning and continuous professional development throughout their careers.

[18] Eurostat. "Population in private households by educational attainment level and NUTS 2 region". Eurostat, 2025.

[19] McNutt, Robert A. "Shared Medical Decision Making: Problems, Process, Progress", *JAMA* 292, no. 20 (2004): 2516.

[20] Consell de Col·legis de Metges de Catalunya (Council of Medical Colleges of Catalonia, CCMC), "Demografia mèdica" ("Medical Demographics"), 31 December 2023. https://www.ccmc.cat/ca/ccmc/demografia

Educational objectives

Bachelor's Degrees in Medicine aim to prepare students for their future role as practising doctors. Graduates will have acquired a solid mastery of the basic sciences, biology, anatomy, physiology, biochemistry, genetics and biostatistics, as well as an understanding of the social determinants of health, public health and epidemiology, and the principles of disease prevention and health promotion.

Throughout the programme, students will develop competencies for effective, respectful and empathetic communication with patients and their relatives, as well as with other medical and healthcare professionals. This includes the ability to explain diagnoses, test results and therapeutic plans in a clear and comprehensible manner.

Professional and ethical values constitute a fundamental component of medical training. Graduates will understand the importance of integrity, honesty and responsibility in daily practice; respect patient confidentiality and informed consent; recognise and manage conflicts of interest; and respect diversity in its social, cultural, gender-related and disability-related dimensions. They will treat patients, families and healthcare professionals with empathy and respect, and will understand the ethical and legal implications of medical practice.

In this context, graduates will be able to work effectively within multidisciplinary teams, recognising both their role and limitations, and coordinating with other professionals to provide safe, patient-centred care while understanding the risks associated with different medical procedures.

Graduates will also recognise the importance of reflecting on their own clinical practice and committing to continuous improvement, grounded in the best available scientific evidence. They will understand the basic principles of research methodology and may be introduced to supervised research projects.

During their studies, students will undertake supervised clinical placements in real healthcare settings, including hospitals, primary care centres and socio-healthcare facilities. As medical experts, graduates will be able to take comprehensive and focused medical histories, perform physical examinations, formulate initial differential diagnoses, request and interpret basic complementary tests, and propose appropriate initial treatments. All of these measures will promote the appropriate, judicious, and evidence-based use of diagnostic testing, therapeutic interventions, and healthcare resources.

In light of the rapid evolution of Medicine and ongoing demographic and social changes, graduates will be capable of self-directed learning and sustaining their continuous professional development throughout their professional lives.

The roles of a physician

One of the most widely used frameworks worldwide for defining medical professional

competencies is **CanMEDS**. [21] Developed by the Royal College of Physicians and Surgeons of Canada (RCPSC), it was first introduced in 1996 and subsequently revised in 2005 and 2015. CanMEDS has been adopted in dozens of countries across five continents, both in Medicine and in other health professions, making it the most recognised and extensively applied competency framework for healthcare professionals globally. Within the European context, it has been formally adopted in countries such as Denmark, Ireland, the Netherlands and Switzerland, and has strongly influenced competency frameworks in many others, including Australia, the United States, New Zealand, the United Kingdom and Singapore.

Although initially conceived for the specialist training of resident doctors, CanMEDS has also been widely adopted for basic medical education. The RCPSC has initiated a review process to update the framework.

At its core, CanMEDS is an initiative aimed at improving patient care through enhanced medical training. Its primary objective is to provide a comprehensive and integrated definition of the competencies required across all areas of medical practice, thereby offering a robust foundation for medical education.

This Reference Document adopts the CanMEDS roles as the organising framework for classifying the learning outcomes expected of graduates of Bachelor's Degrees in Medicine in Catalonia. In addition to the competencies established in Order ECI/332/2008[6], the learning outcomes also consider the role-specific competencies defined by the RCPSC.

CanMEDS defines seven key roles for the medical professional:

- **Medical Expert**: physicians integrate all of the CanMEDS Roles, applying medical knowledge, clinical skills, and professional values in their provision of high-quality and safe patient-centred care. Medical Expert is the central physician Role in the CanMEDS Framework and defines the physician's clinical scope of practice.
- **Communicator**: physicians form relationships with patients and their families that facilitate the gathering and sharing of essential information for effective healthcare.
- **Collaborator**: physicians work effectively with other healthcare professionals to provide safe, high-quality, patient-centred care.
- **Leader**: physicians engage with others to contribute to a vision of a high-quality healthcare system and take responsibility for the delivery of excellent patient care through their activities as clinicians, administrators, scholars, or teachers.
- **Health Advocate**: physicians contribute their expertise and influence as they work

[21] Copyright © 2015 The Royal College of Physicians and Surgeons of Canada. Reproduced with permission. Frank, Jason R., Linda Snell, and Jonathan Sherbino, ed. *CanMEDS 2015 Physician Competency Framework*. Royal College of Physicians and Surgeons of Canada, 2015. https://www.royalcollege.ca/content/dam/document/standards-and-accreditation/2015-canmeds-framework-reduced-e.pdf.

with communities or patient populations to improve health. They work with those they serve to determine and understand needs, speak on behalf of others when required, and support the mobilisation of resources to effect change.

- **Scholar**: physicians demonstrate a lifelong commitment to excellence in practice through continuous learning and by teaching others, evaluating evidence, and contributing to scholarship.
- **Professional**: physicians are committed to the health and well-being of individual patients and society through ethical practice, high personal standards of behaviour, accountability to the profession and society, physician-led regulation, and maintenance of personal health.

Learning outcomes

One of the most significant changes introduced by Spanish legislation in 2021 is the requirement for university degree programmes to explicitly define learning outcomes. To support medical schools in adapting their programmes, this Reference Document sets out below the expected learning outcomes for graduates of Bachelor's Degrees in Medicine.

The learning outcomes are organised according to the medical roles framework and have been developed in strict compliance with Ministerial Order ECI/332/2008. At the same time, they incorporate additional outcomes designed to update the training profile in light of advances in Medicine, the socio-economic and cultural changes of the past 20 years, and the proposals arising from the Professional Dialogue Forum.[10]

Each learning outcome is classified as **Knowledge (K)**, **Skill (S)** or **Competence (C)**. In addition, each outcome indicates its correspondence with the professional competencies established in the relevant ministerial order.

Medical Expert

Area	Learning Outcomes
	The graduate will be able to:
Scientific foundations of Medicine	**LO 1 (K).** Describe the fundamental aspects of cellular morphology, physiology, proliferation and the cell life cycle, as well as the biochemistry and regulation of gene expression. *(C7)* **LO 2 (K).** Describe the structure, morphology and function of organs at the molecular, cellular and organ levels, and their organisation into human body systems in health, across different stages of life and in both sexes. *(C7)* **LO 3 (K):** Describe the systems responsible for the control, regulation and integration of organ and system function and metabolism, as well as the mechanisms underlying homeostasis and adaptation. *(C7)* **LO 4 (K):** Identify the principles and technological basis of procedures used to examine the structure and function of the human body. *(C7)* **LO 5 (S).** Integrate advances in the biomedical sciences into knowledge acquisition

	and clinical practice. *(C7)*
Determinants of health and disease.	**LO 6 (K).** Describe the biological, psychological and social foundations of human personality and behaviour, including potential alterations. *(C8)* **LO 7 (K).** Identify the pathogenic and pathophysiological mechanisms of disease, including defence mechanisms, structural changes and clinical manifestations. *(C9)* **LO 8 (K).** Identify deviations from normal laboratory values and from basic functional and imaging tests, and their possible causes. *(C9)* **LO 9 (K).** Identify biological, physical, mechanical and chemical agents, as well as immunological mechanisms that cause disease. *(C10)* **LO 10 (K).** Identify determinants of health and processes involved in disease development. *(C10)* **LO 11 (K).** Describe the effects of growth, development and ageing on individual health, disease, and social context. *(C11)*
Medical history and clinical examination.	**LO 12 (C).** Produce a structured, clear and accurate medical history, in paper or electronic format, coherently integrating the information obtained while ensuring patient data protection. *(C13)* **LO 13 (S).** Perform a complete and systematic physical examination adapted to the clinical context, using appropriate techniques correctly. *(C14)* **LO 14 (S).** Assess the patient's mental and cognitive status using appropriate techniques and instruments. (C14)
Diagnosis.	**LO 15 (S).** Interpret the clinical significance of information provided by the patient, considering their biopsychosocial context. *(C21)* **LO 16 (C).** Formulate an initial diagnostic judgement based on clinical data from the medical history, physical examination and complementary tests. *(C15)* **LO 17 (C).** Establish a differential diagnosis and a reasoned diagnostic strategy appropriate to the patient's clinical situation, considering effectiveness, cost-effectiveness and procedural safety. *(C15)* **LO 18 (C).** Identify clinical situations posing immediate risk to life or requiring urgent intervention, appropriately interpreting warning signs and symptoms. *(C16)* **LO 19 (C).** Establish a definitive diagnosis and theoretical prognosis, integrating available clinical and scientific information and applying rigorous clinical reasoning. *(C17)*
Treatment plan and clinical practice.	**LO 20 (K).** Explain the principles of action, technological basis, indications, and effectiveness of therapeutic interventions in accordance with available scientific evidence. *(C12)* **LO 21 (S).** Apply basic and advanced life-support measures according to established protocols. *(C16)* **LO 22 (C).** Prioritise urgent clinical interventions, applying safety criteria in the use of available resources. *(C16)* **LO 23 (C).** Propose an individualised treatment plan based on the best available evidence, focused on patient safety, clearly explaining potential risks, benefits and alternative options. *(C17)* **LO 24 (S).** Select the most appropriate pharmacological and non-pharmacological treatments for common acute and chronic conditions, in accordance with scientific evidence and current clinical recommendations. *(C18)* **LO 25 (S).** Plan palliative care interventions for patients in the terminal phase or at the end of life, promoting comfort and dignity, and involving patients and their families in therapeutic decision-making. *(C18)*

Communicator

Area	Learning Outcomes
	The graduate will be able to:
Information gathering and documentation.	**LO 26 (C).** Gather relevant clinical information through effective communication with patients, relatives and other sources, considering their biopsychosocial circumstances and respecting autonomy and confidentiality. *(C13)* **LO 12 (C).** Produce a structured, clear and accurate medical history, in paper or electronic format, coherently integrating the information obtained while ensuring patient data protection. *(C13)* **LO 27 (S).** Synthesise information obtained from patients into a structured, coherent and clinically useful narrative. *(C21)* **LO 28 (S).** Write medical histories and other medical records using clear, precise and comprehensible technical language, organising information into structured sections in accordance with clinical practice standards. *(C22)* **LO 29 (S).** Record relevant patient data accurately in written or electronic systems, ensuring legibility, coherence and traceability. *(C22)* **LO 30 (K).** Identify patient information recording systems that are accurate, legible, up-to-date and complete, and that comply with legal and ethical principles governing patient data management. *(C33)* **LO 31 (S).** Use patient information recording systems appropriately and efficiently, respecting privacy and confidentiality for subsequent analysis and communication with patients, relatives and healthcare professionals. *(C33)*
Interpersonal communication and active listening.	**LO 32 (C).** Listen actively to patients, demonstrating interest, respect and empathy, and attending to both verbal and non-verbal communication. *(C21)*. **LO 33 (C).** Formulate clear and relevant questions, adapting pace and approach to the patient's circumstances and needs to obtain meaningful information about symptoms, history and concerns. *(C21)* **LO 34 (C).** Communicate clearly and effectively with patients and relatives, both orally and in writing, adapting language to the clinical, emotional and socio-cultural context. *(C23/C24)* **LO 35 (C).** Apply interpersonal communication techniques that foster trust and empathy with patients and/or relatives, managing sensitive information and difficult situations appropriately. *(C23/C24)*
Information sharing.	**LO 36 (C):** Exchange information accurately and respectfully with other healthcare professionals, promoting teamwork and shared decision-making. *(C23/C24)* **LO 37 (C). C**ommunicate technical or scientific content orally, in writing, and through digital media with rigour, ethical integrity, and responsibility, adapting language, format, and digital channels to professional or public-facing contexts. *(C23/C24)*

Collaborator

Area	Learning Outcomes
	The graduate will be able to:
Role development.	**LO 38 (C). D**evelop professional practice grounded in an understanding and recognition of the competencies of each health profession within a multiprofessional environment, promoting appropriate task allocation and efficient time management. *(C27)* **LO 39 (C). E**ffectively fulfil one's responsibilities within multidisciplinary and multiprofessional teams, including, where appropriate, assuming leadership roles, and promoting autonomous practice, shared responsibility, and shared decision-making. *(C27)*
Teamwork	**LO 40 (C). D**evelop effective teamwork based on mutual trust and respect among colleagues and team members, recognising the benefits of collaborative and complementary working as a key factor in enhancing collective performance. *(C6)* **LO 41 (K).** Identify one's roles and responsibilities within multidisciplinary and multiprofessional teams across a range of care settings, in the delivery of clinical and care activities and in health promotion and maintenance interventions, reinforcing individual accountability and professional commitment. *(C27)* **LO 39 (C).** Effectively fulfil one's responsibilities within multidisciplinary and multiprofessional teams, including, where appropriate, assuming leadership roles, and promoting autonomous practice, shared responsibility, and shared decision-making. *(C27)* **LO 42 (S).** Use information and communication technology tools to facilitate remote professional collaboration and teamwork, complying with ethical, security, privacy, and data protection standards. *(C32)*

Leader

Area	Learning Outcomes
	The graduate will be able to:
Responsible use of resources.	**LO 43 (S).** Apply the principle of social justice in medical practice by promoting equity in the use of healthcare resources. *(C3)* **LO 44 (S).** Use current information and communication technologies effectively in clinical, therapeutic, preventive and research activities, ensuring the confidentiality of patient information. *(C32)* **LO 45 (C).** Manage healthcare resources efficiently for the benefit of patient health, including material resources, diagnostic tests, technologies and medicines. *(C20)* **LO 39 (C).** Effectively fulfil one's responsibilities within multidisciplinary and multiprofessional teams, including, where appropriate, assuming leadership roles, and promoting autonomous practice, shared responsibility, and shared decision-making. *(C27)*

Health Advocate

Area	Learning Outcomes
	The graduate will be able to:
Health systems and regulation.	**LO 46 (K).** Describe national and international health organisations and the contexts and conditions that influence the functioning and performance of different health systems. *(C29)* **LO 47 (K).** Describe the regulatory and organisational principles of the National Health System, as well as current healthcare legislation and regulations, to ensure ethical, legal and context-aware professional practice. *(C30)*
Responsibility for prevention.	**LO 48 (C).** Assume responsibility for the surveillance, prevention and protection against disease, injury and accidents at individual and community levels. *(C26)*
Risk factors and determinants of health.	**LO 49 (C).** Propose risk factors and prevention strategies in different clinical contexts. *(C19)* **LO 50 (K).** Identify intrinsic population health determinants, including age, sex, ethnicity and genetic factors. *(C25)* **LO 51 (K).** Identify extrinsic determinants of health in the population, including lifestyle factors; psychosocial and community integration; social, occupational, and environmental contexts; the effects of climate change; and determinants arising from economic, social, cultural, and environmental policies, as well as their impact on the health–disease process at both individual and population levels. *(C25)* **LO 52 (S).** Analyse relationships between population health determinants in specific contexts and their influence on the health–disease process. *(C25)*
Epidemiological data.	**LO 53 (S).** Obtain and use epidemiological data to support the surveillance, assessment and identification of population health status and health problems. *(C28)* **LO 54 (S):** Analyse epidemiological data, trends and risks to support decision-making and evidence-based health intervention proposals. (C28)
Preventive interventions.	**LO 55 (C):** Propose personalised preventive interventions tailored to the patient's clinical, psychological and socio-economic profile, based on current scientific recommendations. *(C19)* **LO 56 (C).** Propose strategies and interventions to maintain and promote health and well-being, including actions to foster healthy environments at individual and community levels. *(C26)*

Scholar

Area	Learning Outcomes
	The graduate will be able to:
Lifelong learning.	**LO 57 (S).** Take responsibility for personal learning and development, recognising one's potential contribution to the advancement of medicine. *(C5)* **LO 58 (S).** Maintain professional competence through continuous self-directed learning, reflection, self-critique and self-evaluation. *(C5)*
Scientific method and evidence.	**LO 59 (S).** Apply the scientific method in medical practice to ensure and improve quality of care. *(C5)* **LO 60 (S).** Apply the best available scientific evidence to continuously improve medical practice. *(C5)* **LO 61 (S).** Identify available evidence and its limitations in each professional

	context. *(C34)* **LO 62 (C).** Conduct professional practice based on scientific evidence, demonstrating critical thinking, creativity and support for research. *(C34)* **LO 63 (K).** Describe the principles of the scientific method and its importance for studying, preventing and managing disease based on evidence. *(C35)* **LO 64 (S).** Identify the limitations of applying the scientific method in medicine, given the difficulty of controlling all relevant variables and mechanisms. *(C35)* **LO 65 (C).** Formulate research hypotheses to solve problems, applying the scientific method and critically integrating the reliability and scope of available information. *(C36)*
Information sources.	**LO 66 (K).** Identify available and up-to-date clinical and biomedical information sources, including criteria for quality, validity and reliability. *(C31)* **LO 67 (S).** Use clinical and biomedical information sources to obtain and communicate scientific and health information in a structured, rigorous manner, in accordance with legal and ethical principles. *(C31)* **LO 68 (C).** Critically evaluate information obtained and assess the reliability of medical and biomedical information sources. *(C31)* **LO 69 (S).** Select appropriate information sources for biomedical research tasks, identifying whether they originate from empirical studies, expert reviews, or generative artificial intelligence, among others. *(C36)*
Introduction to research.	**LO 70 (C).** Conduct a basic research activity to complete a project or study, applying the scientific method and acquired research tools. *(C37)*

Professional

Area	Learning Outcomes
	The graduate will be able to:
Ethical principles.	**LO 71 (K).** Identify the ethical principles underpinning the medical profession. *(C1)* **LO 72 (C):** Address ethical issues and implications in healthcare affecting patients within a changing healthcare context. *(C7)*
Principles of the medical profession.	**LO 73 (K):** Recognise the legal principles governing professional practice, including the rights and duties of patients and doctors. *(C1)* **LO 74 (K).** Identify the general principles of the medical profession and the commitments inherent in medical professionalism for the practice of patient-centred medicine. *(C1)* **LO 75 (K).** Identify the doctor's responsibilities as a scientist (towards science), as a clinician (towards patients), and as a professional (towards society). *(C2)*
Doctor–patient relationship.	**LO 76 (C).** Practise patient-centred medicine in a range of clinical and healthcare settings, commensurate with level of training and under appropriate supervision. *(C20)* **LO 77 (C).** Establish a relationship of trust with patients, including confidentiality and professional secrecy. *(C2)* **LO 78 (S).** Demonstrate respect for the patient's right to receive clear, accurate and timely information about their illness. *(C3)* **LO 79 (C).** Apply patient autonomy principles and support informed decision-making by providing sufficient, appropriate and understandable information to support informed choices. *(C4)*

LO 80 (C). Address social and cultural factors influencing healthcare, with particular attention to equality, diversity and inclusion. *(C4)*

Degree characteristics

As explained above, studies leading to the medical profession are regulated at the national level in Spain. These studies are offered as a university degree corresponding to level 7 of the European Qualifications Framework (EQF); that is, master's level. A total of 82% of the curriculum, in terms of competencies and content, is set by Ministerial Order ECI/332/2008. [6] The regulation establishes a curriculum structured into five broad modules, which universities then specify in greater detail through subjects and courses:

a) Morphology, Structure and Function of the Human Body (64 ECTS credits)
b) Social Medicine, Communication Skills and Introduction to Research (30 ECTS credits)
c) Human Clinical Training (100 ECTS credits)
d) Diagnostic and Therapeutic Procedures (40 ECTS credits)
e) Supervised Placements and Bachelor's Thesis (60 ECTS credits)

Faculties must comply with these modules and the stipulated minimum number of credits, either by directly adopting the structure defined in the ministerial order or by proposing an alternative structure that clearly demonstrates correspondence with the prescribed modules. The same requirement applies to the associated competencies.

All international standards require that the principles of the scientific method and evidence-based medicine be integrated throughout the curriculum. Graduates must acquire a sufficient understanding of the scientific foundations of Medicine to apply them effectively in clinical settings. The curriculum must foster analytical and critical thinking and include specific laboratory-based, practical or simulated activities in which students collect, analyse and interpret data and test hypotheses. The ethical principles underpinning clinical and translational research must also be addressed, including research conduct, the evaluation of studies, and patient information and consent.

Behavioural and social sciences, as well as medical ethics, must be adequately incorporated into the curriculum. This includes key aspects of professionalism, the ability to collaborate with colleagues, awareness of one's own strengths and limitations, understanding the legal and ethical responsibilities of a doctor, and a commitment to continuous learning, self-assessment and reflective practice. The complexities and dilemmas of clinical practice should also be explored in relation to diverse cultural and religious backgrounds. [22,23]

[22] World Federation for Medical Education. "Basic Medical Education. WFME Global Standards For Quality Improvement". WFME, 2020. https://wfme.org/wp-content/uploads/2020/12/WFME-BME-Standards-2020.pdf.

[23] MacCarrick, Geraldine. *Quality Assurance in Medical Education: A Practical Guide*. Springer London, 2013. https://doi.org/10.1007/978-0-85729-713-6.

With regard to clinical training, curricula must ensure that students spend a substantial proportion of their training in direct contact with patients, while also providing adequate time and opportunities for structured reflection on clinical experiences. The use of simulation and other virtual learning resources contributes to the enhancement of clinical education. Clinical training should be organised into independent rotations with final competency-based assessments, delivered in health centres, hospitals and other care settings. These rotations should support the development of professional values, communication skills, clinical reasoning, clinical management and critical judgement, as well as exposure to the most prevalent health problems.

Students must encounter curricular content related to all stages of the human life course and be able to recognise and interpret the signs and symptoms of disease affecting all organ systems.

Basic medical education programmes must ensure appropriate training in communication skills, including communication with patients and their families, colleagues and other health professionals, as well as with patients from diverse cultural backgrounds, religions, genders and age groups.[6]

Medical ethics and human values, such as honesty, integrity, confidentiality and respect for patients, patients' families, fellow students and other health professionals, must be integral to the education of future doctors. [6, 24, 25]

Students should also receive training in quality assurance, risk management and continuous improvement. They must understand the healthcare system in which they will practise, including its main public health policies, legal framework and organisational and management structures.

Given that these studies correspond to level 3 of the MCQES (level 7 of the EQF), it must be ensured that graduates achieve sufficient competence to undertake basic research in the field of Medicine. In this context, the Bachelor's Thesis should be framed within the 60 ECTS credits corresponding to master's-level training at the end of the curriculum.

Equity, student diversity and gender equality

As established by Royal Decree 822/2021[26], official university degrees must, as a general

[24]General Medical Council (GMC) and Medical Schools Council (MSC). *Professional Behaviour and Fitness to Practice: Guidance for Medical Schools and Their Students*. GMC, MSC, 2016. https://www.gmc-uk.org/cdn/documents/professional-behaviour-and-fitness-to-practise-20210811_pdf-66085925.pdf.

[25] Australian Medical Council Limited. *Standards for Assessment and Accreditation of Primary Medical Programs*. AMC, 2024. https://www.amc.org.au/wp-content/uploads/2023/08/AMC-Medical_School_Standards-FINAL.pdf.

[26] Ministerio de Universidades (Ministry of Universities), "Real Decreto 822/2021, de 28 de septiembre, por el que se establece la organización de las enseñanzas universitarias y del procedimiento de aseguramiento de su

principle, be grounded in democratic values and aligned with the Sustainable Development Goals (Article 4.2).

Curricula must respect human rights, fundamental freedoms and democratic principles, including freedom of thought and academic freedom, tolerance, recognition and respect for diversity, equity for all individuals, the elimination of discriminatory content or practices, and the promotion of a culture of peace and participation.

They must also uphold the constitutional principles of equal treatment and non-discrimination on grounds such as birth, national or ethnic origin, religion, belief or opinion, age, disability, sexual orientation, gender identity or expression, sexual characteristics, illness, socio-economic status or any other personal or social condition or circumstance.[27,28,29,30]

In addition, curricula must incorporate the principles of universal accessibility and design for all[31], and address issues related to sustainability and climate change[32].

In medical education, particular attention should be paid to structural racism, health inequities and the social determinants of health. Pedagogical strategies that promote equity, such as simulation, case-based learning and guided discussions, are recommended, alongside the continuous review of teaching plans and clinical guidelines to avoid bias or inappropriate language. Teaching materials, including clinical images, should be carefully

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calidad" (Royal Decree 822/2021, of 28 September, establishing the organisation of university studies and the procedure for quality assurance), Official Spanish Gazette (233), 2021, pgs. 119537–119578. BOE-A-2021-15781

[27] Jefatura del Estado (Head of State), "Ley Orgánica 3/2007, de 22 de marzo, para la igualdad efectiva de mujeres y hombres" (Organic Law 3/2007, of 22 March, for the effective equality of women and men), Official Spanish Gazette (71), 2007, pgs. 12611–12645. BOE-A-2007-6115

[28] Jefatura del Estado (Head of State), "Ley 15/2022, de 12 de julio, integral para la igualdad de trato y la no discriminación" (Law 15/2022, of 12 July, comprehensive for equal treatment and non-discrimination), Official Spanish Gazette (167), 2022, pgs. 98071–98109. BOE-A-2022-11589. https://www.boe.es/eli/es/l/2022/07/12/15/con. BOE-A-2022-11589

[29] Presidència de la Generalitat de Catalunya (Presidency of the Government of Catalonia), "LLEI 17/2015, del 21 de juliol, d'igualtat efectiva de dones i homes" (Law 17/2015, of 21 July, on effective equality of women and men), Official Gazette of the Government of Catalonia (6919), 2015. CVE-DOGC-A-15202111-2015

[30] Presidència de la Generalitat de Catalunya (Presidency of the Government of Catalonia), "LLEI 17/2020, del 22 de desembre, de modificació de la Llei 5/2008, del dret de les dones a erradicar la violència masclista" (Law 17/2020, of 22 December, amending Law 5/2008, on the right of women to eradicate gender-based violence), Official Gazette of the Government of Catalonia (8303), 2020. CVE-DOGC-A-20357121-2020

[31] Jefatura del Estado (Head of State), "Ley 6/2022, de 31 de marzo, de modificación del Texto Refundido de la Ley General de derechos de las personas con discapacidad y de su inclusión social, aprobado por el Real Decreto Legislativo 1/2013, de 29 de noviembre, para establecer y regular la accesibilidad cognitiva y sus condiciones de exigencia y aplicación" (Law 6/2022, of 31 March, amending the consolidated text of the General Law on the rights of persons with disabilities and their social inclusion, approved by Royal Legislative Decree 1/2013, of 29 November, to establish and regulate cognitive accessibility and its conditions of requirement and application), Official Spanish Gazette (78), 2013, pgs. 43626–43633. BOE-A-2022-5140

[32] Jefatura del Estado (Head of State), "Ley 7/2021, de 20 de mayo, de cambio climático y transición energética" (Law 7/2021, of 20 May, on climate change and energy transition), Official Spanish Gazette (121), 2021, pgs. 62009–62052. BOE-A-2021-8447

reviewed to prevent the reinforcement of stereotypes.

Accordingly, it is essential to provide training for teaching staff in inclusive pedagogical practices, empathy, cultural humility and the management of implicit bias. Medical schools have access to extensive scientific literature to guide curriculum development in this area, including resources such as the Diversity, Equity and Inclusion Assessment Toolkit developed by the International Association of Medical Science Educators (IAMSE). [33]

[33] Hotzman, Jennifer L, Heather Christensen, Carrie Elzie, et al. "Diversity, Equity and Inclusion (DEI) Assessment Toolkit". International Association of Medical Science Educators (IAMSE), 2023. https://www.iamse.org/wp-content/uploads/2025/05/6-IAMSE_2023_DEI_Toolkit.pdf.

TEACHING, LEARNING AND ASSESSMENT

This Reference Document is not intended to be prescriptive regarding specific teaching methods, learning activities or assessment approaches for medical studies. The selection of appropriate methods is the responsibility of each degree programme and should be based on factors such as the intended learning outcomes, educational objectives, mode of delivery, availability and profile of teaching staff, and material and institutional resources.

Nevertheless, regardless of how these aspects are specified in individual degree programmes and subjects, a set of general recommendations is provided to support the effective design and implementation of teaching, learning and assessment processes and the evaluation of student achievement.

The learning environment

The medical school learning environment encompasses the physical, social and psychological contexts in which medical students learn and develop professionally, and it strongly influences their behaviour and identity formation as future doctors. It includes the student's broader experience within the academic institution, such as the curriculum, facilities and interactions with peers, teaching staff, other staff members, patients and their families, as well as students' perceptions of the learning climate and institutional culture.[34]

First, the learning environment and organisational culture must value and support education and training, enabling students to demonstrate good medical practice and to achieve the learning outcomes defined by the curriculum. Secondly, the environment must be safe for patients and provide appropriate support for both students and teaching staff. The institutional culture should be supportive and compassionate and ensure a high standard of care and experience for patients, professionals and families. [35]

In summary, medical schools must ensure that both the educational environment and the culture of training meet the needs of students and teaching staff, are safe, inclusive and open, and deliver a high standard of care and experience for patients. Education and training should be recognised as core elements of the organisational culture. A positive educational experience for students and recognition of teaching staff depend on clear institutional commitment to learning. Given the multiprofessional nature of the learning environment, an effective learning culture must also promote and value constructive interaction between students and all professional groups.

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[34] Shochet, Robert B., Jorie M. Colbert-Getz, and Scott M. Wright. "The Johns Hopkins Learning Environment Scale: Measuring Medical Students' Perceptions of the Processes Supporting Professional Formation". *Academic Medicine* 90, no. 6 (2015): 810-18. https://doi.org/10.1097/ACM.0000000000000706.

[35] General Medical Council (GMC). *Promoting Excellence: Standards for Medical Education and Training*. GMC, 2015. https://www.gmc-uk.org/-/media/documents/promoting-excellence-standards-for-medical-education-and-training_pdf-108339649.pdf.

As medical schools and teaching units are jointly responsible for maintaining a high-quality learning environment, it is recommended that they share responsibility for regularly evaluating its quality. This should include monitoring compliance with expected standards and implementing strategies to strengthen positive features and address identified challenges.

Teaching methodology and training activities

In accordance with the *Standards and Guidelines for Quality Assurance in the European Higher Education Area (Estándares y Directrices para la Garantía de Calidad en el Espacio Europeo de Educación Superior, ESG)* [36], institutions must ensure that educational programmes are delivered in a way that encourages students to take an active role in shaping their learning and that assessment reflects this approach.

There is a substantial body of scientific literature on teaching methodologies and training activities applicable to medical education. Most are similar to those used in other university degrees. Crucially, however, the educational programme must ensure that the intended learning outcomes are aligned with teaching methods, student activities, and assessment practices. This principle is known as constructive alignment. [37] [38] It requires internal coherence between the intended learning outcomes, curriculum content, teaching strategies, learning activities, and assessment methods and criteria. Proper alignment facilitates the achievement of learning outcomes. In medical education, this approach is also referred to as outcome-based education, and it has become a central development in the training of doctors in recent years. [39]

For example, if a course has learning outcomes aimed at comprehension, such as demonstration, explanation, or interpretation, but the teaching method is a lecture, student activities are limited to note-taking and occasional questions, and assessment is solely summative at the end of the module, alignment is lacking. Students are not given the

[36] European Association for Quality Assurance in Higher Education, European Students' Union, European University Association, and European Association of Institutions in Higher Education, *Standards and Guidelines for Quality Assurance in the European Higher Education Area (Estándares y Directrices para la Garantía de Calidad en el Espacio Europeo de Educación Superior, ESG)*, ENQA, ESU, EUA. EURASHE, 2015. https://www.enqa.eu/wp-content/uploads/2015/11/ESG_2015.pdf.

[37] Hutchings, Pat. "Aligning Educational Outcomes and Practices". *Occasional Paper*, no. 26 (January 2016): 1-20. https://www.learningoutcomesassessment.org/wp-content/uploads/2019/02/OccasionalPaper26.pdf.

[38] Biggs, John B., and Catherine Tang. *Teaching for Quality Learning at University: What the Student Does*. 4th edition. With the Society for Research into Higher Education. SRHE and Open University Press Imprint. McGraw-Hill, Society for Research into Higher Education & Open University Press, 2011. https://cetl.ppu.edu/sites/default/files/publications/-John_Biggs_and_Catherine_Tang-_Teaching_for_Quali-BookFiorg-.pdf.

[39] Pierre-André Michaud, Patrick Jucker-Kuppe, and Profiles working group. "The 'Profiles' Document: A Modern Revision of the Objectives of Undergraduate Medical Studies in Switzerland". *Swiss Medical Weekly*, advance online publication, 1 February 2016. https://doi.org/10.4414/smw.2016.14270.

opportunity to practise the intended learning outcomes or monitor their progress throughout the course. Therefore, when designing a course, the intended learning outcomes must be carefully aligned with the assessment methods and corresponding criteria. Moreover, mechanisms must be established to provide direct and constructive feedback on the extent to which students have achieved these outcomes. [40]

The International Association for Medical Education (AMEE) has published the guide *Curriculum Mapping: A Tool for Transparent and Authentic Teaching and Learning*, which can assist medical schools in achieving constructive alignment across their curricula. [41]

The teaching strategies most frequently employed in medical education include lectures, case-based learning, problem-based learning, best evidence in medical education (BEME) [42], simulation-based learning, virtual learning, peer-assisted learning, observational learning, the flipped classroom, and team-based learning.

A general recommendation for curriculum development and implementation is the progressive introduction of teaching methods, particularly innovative approaches, whilst ensuring the constructive alignment of all curricular elements. Teaching staff should be adequately trained in medical education and maintain ongoing professional development. Furthermore, it is recommended to employ varied assessment methods (see the following section) and provide students with timely and constructive feedback to support their learning.

Entrustable Professional Activities (EPAs)

In some contexts, particularly in clinical training, learning outcomes alone may remain relatively abstract. To translate learning outcomes into concrete professional tasks that learners can perform in practice, Olle ten Cate introduced the concept of *Entrustable Professional Activities (EPAs)* in 2005. [43] The use of EPAs in clinical education can improve the quality of workplace learning and enhance satisfaction with clinical placements for both students and future employers (see the section on *Employability*).

EPAs are defined as units of professional practice that require the integration of appropriate knowledge, skills and attitudes, lead to a recognisable professional outcome, can be

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[40] Torres-Solà, Josep Manel. *Evaluación de los resultados de aprendizaje (Assessment of Learning Outcomes)*, 1st ed. With Sebastián Rodríguez-Espinar. FOCUS 2. AQU Catalunya, 2023. https://www.aqu.cat/es/content/download/13379/file/Evaluación%20de%20los%20resultados%20de%20aprendizaje.pdf?version=6.

[41] Ronald M. Harden. "AMEE Guide No. 21: Curriculum Mapping: A Tool for Transparent and Authentic Teaching and Learning". *Medical Teacher* 23, no. 2 (2001): 123-37. https://doi.org/10.1080/01421590120036547.

[42] Ronald M. Harden, Janet Grant, Graham Buckley, and I. R. Hart. "BEME Guide No. 1: Best Evidence Medical Education". *Medical Teacher* 21, no. 6 (1999): 553-62. https://doi.org/10.1080/01421599978960.

[43] Ten Cate, Olle. "Entrustability of Professional Activities and Competency-based Training". *Medical Education* 39, no. 12 (2005): 1176-77. https://doi.org/10.1111/j.1365-2929.2005.02341.x.

executed independently within a defined timeframe, are observable and measurable in both process and outcome, and reflect one or more competencies. [4445]EPAs provide a practical means of translating learning outcomes into clinical practice and are embedded within the framework of **Competency-Based Medical Education (CBME)**. [46] They do not prescribe specific teaching methods, rather the pedagogical approaches through which students become competent in performing EPAs depend on the design of the educational programme and the expertise of the teaching staff.

Although originally developed for postgraduate specialist training, EPAs are now widely used in undergraduate medical education. Inevitably, EPAs for medical students involve a more limited scope of responsibility than those defined for resident doctors. Medical students always require direct or indirect supervision, regardless of their level of performance, unlike residents, who may practise with greater autonomy. These limits on student autonomy are largely determined by current legal and regulatory frameworks. The educational challenge lies in creating a learning environment in which supervision is sufficiently close to ensure patient safety, yet sufficiently flexible to promote increasing responsibility and support progressive learning. [4748] Olle ten Cate and colleagues have proposed a framework of supervision levels that reflect graduated trust and responsibility, which may be particularly useful for implementing EPAs in undergraduate medical programmes. [49] EPAs can facilitate the transition from a primarily observational role to more authentic and progressively autonomous clinical practice, whilst ensuring appropriate supervision.

One of the most extensively developed EPA frameworks is the **Core Entrustable Professional Activities for Entering Residency**, defined by the **Association of American Medical Colleges (AAMC)**. [50] The AAMC identifies thirteen activities that medical graduates should be able to perform, with varying levels of supervision:

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[44] Gummesson, Christina, Stina Alm, Anna Cederborg, et al. "Entrustable Professional Activities (EPAs) for Undergraduate Medical Education – Development and Exploration of Social Validity". *BMC Medical Education* 23, no. 1 (2023): 635. https://doi.org/10.1186/s12909-023-04621-6.

[45] Ten Cate, Olle. "Nuts and Bolts of Entrustable Professional Activities". *Journal of Graduate Medical Education* 5, no. 1 (2013): 157-58. https://doi.org/10.4300/JGME-D-12-00380.1.

[46] Cate, Th J. ten, Vanessa Burch, H. Carrie Chen, Fremen Chihchen Chou, and Marije P. Hennus, ed. *Entrustable Professional Activities and Entrustment Decision-Making in Health Professions Education* Ubiquity Press, 2024.

[47] Babbott, Stewart. "Commentary: Watching Closely at a Distance: Key Tensions in Supervising Resident Physicians": *Academic Medicine* 85, no. 9 (2010): 1399-400. https://doi.org/10.1097/ACM.0b013e3181eb4fa4.

[48] Olle ten- Cate. "Supervision and Entrustment in Clinical Training: Protecting Patients, Protecting Trainees". *PSNet [Internet]*, Rockville (MD): Agency for Healthcare Research and Quality, US Department of Health and Human Services, 2018. https://psnet.ahrq.gov/web-mm/supervision-and-entrustment-clinical-training-protecting-patients-protecting-trainees.

[49] Ten Cate, Olle, Danielle Hart, Felix Ankel, et al. "Entrustment Decision Making in Clinical Training". *Academic Medicine* 91, no. 2 (2016): 191-98. https://doi.org/10.1097/ACM.0000000000001044.

[50] Association of American Medical Colleges. *Core Entrustable Professional Activities for Entering Residency. Curriculum Developers' Guide*. AAMC, 2014. https://store.aamc.org/downloadable/download/sample/sample_id/63/%20.

1. Gather a history and perform a physical examination.
2. Prioritise a differential diagnosis following a clinical encounter.
3. Recommend and interpret common diagnostic and screening tests.
4. Enter and discuss orders and prescriptions.
5. Document a clinical encounter in the patient record.
6. Provide an oral presentation of a clinical encounter.
7. Form clinical questions and retrieve evidence to advance patient care.
8. Give or receive a patient handover to transition care responsibility.
9. Collaborate as a member of an interprofessional team.
10. Recognise a patient requiring urgent or emergent care and initiate evaluation and management.
11. Obtain informed consent for tests and/or procedures.
12. Perform general procedures of a physician.
13. Identify system failures and contribute to a culture of safety and improvement.

These EPAs have been adapted to national and institutional contexts in several countries, notably Canada[51], Switzerland[52] and Australia[53].

In addition, AMEE has published the guide *Curriculum Development for the Workplace Using Entrustable Professional Activities (EPAs)*, which supports faculties and affiliated healthcare institutions in the development and implementation of EPAs[54]. Marije P. Hennus and colleagues also propose twelve practical tips for developing EPAs, which may be particularly helpful when designing them collaboratively with healthcare centres. [55]

Faculties must ensure that educational experiences are designed so that students can achieve comparable learning outcomes regardless of the placement site. Although the range and frequency of clinical conditions encountered may vary across settings, each rotation must guarantee sufficient exposure to core clinical experiences. Similarly, time allocated to hospital-based, community and other outpatient settings should be broadly equivalent, and any limitations inherent in specific learning environments must be addressed.

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[51] Association of Faculties of Medicine of Canada. "AFMC Entrustable Professional Activities for the Transition from Medical School to Residency". September 2016. https://www.afmc.ca/wp-content/uploads/2022/10/AFMC_Entrustable-Professional-Activities_EN_Final.pdf.

[52] Pierre-André Michaud et al., «The "Profiles" Document».

[53] Australian Medical Council Limited. *Training and Assessment: Training and Assessment Requirements for Prevocational PGY1 and PGY2 Training Programs*. Australian Medical Council Limited, 2022. https://www.amc.org.au/wp-content/uploads/2022/07/Training-and-assessment-—-Training-and-assessment-requirements-for-prevocational-PGY1-and-PGY2-training-programs.pdf.

[54] Ten Cate, Olle, Huiju Carrie Chen, Reinier G. Hoff, Harm Peters, Harold Bok, and Marieke Van Der Schaaf. "Curriculum Development for the Workplace Using Entrustable Professional Activities (EPAs): AMEE Guide No. 99". *Medical Teacher* 37, no. 11 (2015): 983-1002. https://doi.org/10.3109/0142159X.2015.1060308.

[55] Hennus, Marije P., Jennie B. Jarrett, David R. Taylor, and Olle Ten Cate. "Twelve Tips to Develop Entrustable Professional Activities". *Medical Teacher* 45, no. 7 (2023): 701-7. https://doi.org/10.1080/0142159X.2023.2197137.

It is important not to confuse EPAs with learning outcomes (knowledge, skills and competencies). Unlike learning outcomes, EPAs are not attributes of individuals but *tasks to be performed*. If a competency refers to the ability to do something effectively, the EPA is the actual professional activity that requires that ability. Performing an EPA requires the integrated application of knowledge, skills and competencies. EPAs can be assigned and assessed, but they cannot be "possessed" by individuals. [56]

Like learning outcomes, EPAs clarify expectations for students by specifying the professional tasks they are expected to master during clinical training. They also facilitate the integration of multiple assessment methods, such as mini-CEX, OSCEs and DOPS. The use of electronic portfolios may serve as a valuable tool for longitudinal and systematic monitoring of EPAs across the clinical rotation.

Assessment

There is broad consensus in higher education, particularly in Europe since the implementation of the European Higher Education Area (EHEA), that assessment should extend beyond the measurement of student achievement and be understood as an integral component of the learning process. Assessment therefore involves the systematic collection, review and use of information about educational programmes with the aim of improving student learning and development. [57] In medical education, this approach is often referred to as *programme assessment* or *longitudinal assessment*. It supports students in taking responsibility for their own learning and prepares them for lifelong professional development.

Assessment activities in medical education must be aligned with curriculum content, teaching and learning methods, educational objectives and intended learning outcomes, ensuring constructive alignment, validity and reliability.

Degree programmes must clearly specify assessment activities and teaching staff expectations to ensure transparency and must define appropriate criteria and standards that support high-quality learning. [58]

Particular emphasis should be placed on high-quality formative assessment, supported by regular and timely feedback, and on ensuring that sufficient assessment opportunities are

[56] Ten Cate, Olle, and Daniel J. Schumacher. "Entrustable Professional Activities versus Competencies and Skills: Exploring Why Different Concepts Are Often Conflated". *Advances in Health Sciences Education* 27, no. 2 (2022): 491-99. https://doi.org/10.1007/s10459-022-10098-7.

[57] Banta, Trudy W., and Catherine A. Palomba. *Assessment essentials: planning, implementing, and improving assessment in higher education*. Second Edition. Jossey-Bass higher and adult education series. Jossey-Bass & Pfeiffer Imprints, 2014. https://www.wiley.com/en-us/Assessment+Essentials%3A+Planning%2C+Implementing%2C+and+Improving+Assessment+in+Higher+Education%2C+2nd+Edition-p-9781118903650.

[58] Angelo, Thomas A. "Reassessing (and Defining) Assessment". *AAHE Bulletin* 48, no. 3 (1995): 3.

distributed throughout the programme. Assessment strategies should include direct observation of clinical skills, professional behaviours and other key domains of practice. [59]

Assessment systems must be feasible and sustainable, with workloads that can be reasonably managed by both students and teaching staff. Consequently, assessment design must consider the resources available to the programme.

It is essential that teaching staff provide students with clear and constructive feedback on their performance, progress and areas for improvement. Effective formative feedback requires the planned scheduling of multiple assessment tasks that enable students to monitor their progress and allow teaching staff to guide them towards achieving the intended learning outcomes. Feedback from teaching staff has been shown to significantly enhance student success. [38, 60]

To ensure high-quality supervision, academic staff within clinical teaching units should be allocated dedicated time for teaching activities, including the planning, monitoring, and assessment of students during their training placements in healthcare settings. Under current conditions, balancing clinical duties with teaching responsibilities is particularly challenging, which may adversely affect the quality of training. Institutional planning that explicitly addresses this issue would support progress towards excellence in the education of medical graduates, with a corresponding positive impact on the quality of care provided to the population.

Finally, assessment activities must be adapted to the characteristics of the student population, particularly students with disabilities or specific educational needs. Robust mechanisms must also be in place to prevent, detect and address unacceptable academic practices, such as plagiarism or other forms of academic misconduct.

For more detailed information on the assessment of learning outcomes in medical education, faculties can refer to a comprehensive guide published by AQU Catalunya in 2009. [61]

Objective Structured Clinical Examination (OSCE)

The OSCE is, without question, the most widely used method for assessing clinical learning outcomes in basic medical education. All Catalan universities use OSCEs in their curricula.

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[59] MacCarrick, Geraldine. *Quality Assurance in Medical Education: A Practical Guide*. Springer London, 2013. https://doi.org/10.1007/978-0-85729-713-6.

[60] Lipnevich, Anastasiya A., Krista Mattern, and Christopher Feddock. “Formative Assessment and Feedback in Medical Education: A Practical Guide: AMEE Guide No. 189”. *Medical Teacher*, 24 October 2025, 1-20. https://doi.org/10.1080/0142159X.2025.2569623.

[61] Carreras-Barnés, Josep, Luis Alberto-Branda, Antoni Castro-Salomó, et al. *Guía para la evaluación de competencias en Medicina (Guide for the Assessment of Competencies in Medicine)*, 1st ed. *Guías para la evaluación de competencias (Guides for the Assessment of Competencies)*, published by Sebastián Rodríguez-Espinar and Anna Prades-Nebot AQU Catalunya, 2009. https://www.aqu.cat/doc/Estudis/Informes-dels-processos-d-avaluacio/Guia-para-la-evaluacion-de-competencias-en-Medicina.

The OSCE is a practice-based examination in which students are observed and scored whilst rotating through a series of stations where different clinical situations are reproduced, according to an established plan. Instruments for assessment include standardised patients, mannequins or simulation models, complementary examinations and clinical reports. [62] The number of stations can vary between 6 and 40, although a typical OSCE usually contains around 20. The time allocated to each station is uniform to allow smooth rotation. A key feature of the OSCE is that all students are assessed on the same set of stations.

Another key feature of the OSCE is that what is to be assessed at each station and the assessment criteria are established prior to the examination. Both the activity, such as taking blood pressure, prescribing, etc., and the criteria for assessing it (appropriateness of technique use, examination, attitude, communication with the patient, etc.) must be established. Everything that will be assessed during the examination is carefully planned and agreed upon before it is carried out. Providing feedback to students is essential for consolidating learning outcomes.

There is extensive research demonstrating the validity and reliability of the OSCE for assessing the expected learning outcomes in student clinical practice, considering the necessary elements to ensure it in different contexts. [636465666768] This reliability makes OSCEs ideal instruments for assessing the acquisition of learning outcomes related to clinical practice throughout the curriculum, for example in the form of mini-OSCEs.

Although there is little research on the matter, it is evident that one of the greatest obstacles to implementing OSCEs is cost in terms of human, material resources and time.

Relationship between EPAs and OSCEs

As mentioned, EPAs define the tasks that a doctor must master and that should be

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[62] Harden, Ronald M., Patricia Lilley, and Madalena Patricio. The definitive guide to the OSCE: the Objective Structured Clinical Examination as a performance assessment. Elsevier, 2016.

[63] Patrício, Madalena Folque, Miguel Julião, Filipa Fareleira, and António Vaz Carneiro. "Is the OSCE a Feasible Tool to Assess Competencies in Undergraduate Medical Education?" *Medical Teacher* 35, no. 6 (2013): 503-14. https://doi.org/10.3109/0142159X.2013.774330.

[64] Sloan, David A., Michael B. Donnelly, Richard W. Schwartz, Janet L. Felts, Amy V. Blue, and William E. Strodel. "The Use of the Objective Structured Clinical Examination (OSCE) for Evaluation and Instruction in Graduate Medical Education". *Journal of Surgical Research* 63, no. 1 (1996): 225-30. https://doi.org/10.1006/jsre.1996.0252.

[65] Gormley, Gerry. "Summative OSCEs in Undergraduate Medical Education". *The Ulster Medical Journal* 80, no. 3 (2011): 127-32.

[66] Yazbeck Karam, Vanda, Yoon Soo Park, Ara Tekian, and Nazih Youssef. "Evaluating the Validity Evidence of an OSCE: Results from a New Medical School". *BMC Medical Education* 18, no. 1 (2018): 313. https://doi.org/10.1186/s12909-018-1421-x.

[67] Chan, Cho-Yu. "Is OSCE Valid for Evaluation of the Six ACGME General Competencies?" *Journal of the Chinese Medical Association* 74, no. 5 (2011): 193-94. https://doi.org/10.1016/j.jcma.2011.03.012.

[68] Tudiver, Fred, Doug Rose, Burt Banks, and Deborah Pfortmiller. "Reliability and Validity Testing of an Evidence-Based Medicine OSCE Station". *Family Medicine* 41, no. 2 (2009): 89-91.

entrusted to them, whilst an OSCE is an assessment tool used to measure the underlying knowledge, skills and competencies necessary to perform those tasks. In this sense, OSCEs can be established as an assessment method for EPAs and, conversely, OSCEs can be designed integrating EPAs.

EMPLOYABILITY

AQU Catalunya conducts a graduate labour market insertion survey every three years for graduates of bachelor's, master's, and doctoral degrees from the Catalan University System (SUC). In the case of Bachelor's Degrees in Medicine, the survey targets individuals who graduated seven years previously. The most recent survey was carried out in 2023. [69] Additionally, two opinion studies have been conducted with the principal employers of Medicine graduates, the latest dating from 2019.[70]

These studies indicate that Medicine graduates in Catalonia demonstrate strong academic performance and enjoy excellent labour market outcomes. However, the training system exhibits notable deficiencies in both transversal and discipline-specific competencies that are essential for contemporary clinical practice, including autonomy, decision-making, communication, management of uncertainty, and critical reasoning.

These shortcomings affect both the general preparedness of graduates and their transition to the MIR system, particularly given that the entrance examination remains primarily theoretical and is poorly aligned with the competency framework established by universities.

Satisfaction with studies

Firstly, a very high level of satisfaction is observed among graduates with their training (7.5/10). This satisfaction is similar to that of other degrees in the Health Sciences area and higher than the SUC as a whole. They particularly value training in professional capabilities (7.6), personal competencies and communication skills (7.1).

External placements receive a high score (7.2), higher than the system average (6.8). In contrast, the perceived usefulness of the Bachelor's Thesis (*Trabajo Fin de Grado*, TFG) is low (5.2), below the SUC average and the overall Health studies average.

Labour market insertion

According to the results of the latest labour market insertion survey conducted by AQU Catalunya, 98% of graduates of Medicine degrees are employed, and 98.7% of them perform functions specific to their profession and are very satisfied with their job (8/10). 68% found their first job within a year (58% within three months). Access to the first job is mainly through competitive examinations or job pools (52%).

Regarding working conditions, 93% work full-time and have a salary above €2,000 per

[69] Agència per a la Qualitat del Sistema Universitari de Catalunya. "University Studies of Catalonia (EUC)—Data" ("Estudis Universitaris de Catalunya (EUC)—Dades"), EUC Dades, consulted on 27 November 2025. https://estudis.aqu.cat/euc/es/Dades/Enquestes#.

[70] Nieto-Viramontes, *L'opinió del col·lectiu ocupador sobre la formació dels Metges Interns Residents (MIR)*.

month. 83% have no management responsibilities. 82% work in public healthcare and temporary employment stands at 49%. Almost all graduates work in Spain (97%).

Regarding their training, 87% would choose Medicine studies again and 86% would do so at the same faculty.

Labour market insertion and transition to specialist training

The Medicine degree has an excellent level of labour market insertion: 96% of graduates are working seven years later and 99% do so in functions specific to the degree. Although temporary employment is common, salaries are significantly higher than the university average.

Healthcare centres consider the access procedure to specialist training to be, in general, adequate. However, they criticise that the residency access examination is too theoretical and that the academic transcript only represents 10% of the final grade, so a substantial part of the learning outcomes acquired during basic training are not considered. This perception has important implications to the point of suggesting that the mission of some degrees essentially ends up being preparing students to pass a theoretical examination.

Competency level of graduates

The main strengths perceived by heads of department in hospital centres receiving graduates are theoretical training (7.7/10), practical training (6.6, a value higher than the SUC average) and an adequate level of cognitive competencies and clinical knowledge. Furthermore, compared with previous labour market insertion studies, they note an improvement in languages and IT skills.

On the other hand, according to their criteria, the acquisition of other learning outcomes needs improvement. Specifically, 73% of heads of department interviewed consider problem-solving and decision-making capable of improvement; 63%, autonomous work and time management; 56% point to shortcomings in work responsibility; 47%, in teamwork; and 44%, in learning and self-learning ability. These weaknesses coincide with the assessment that graduates themselves make of their competency preparation in the labour market insertion survey, reinforcing the consistency of the diagnosis.

Regarding learning outcomes linked to clinical practice, the most deficient are critical thinking and continuous improvement (69% of heads of department indicate this), appropriate management of healthcare resources (67%), communication and empathy with patients and families (61%), management of clinical uncertainty (59%) and evidence-based clinical practice (34%). Heads of department consider these learning outcomes to be determinant for success in specialist training.

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[71] NISO CRediT Working Group, *ANSI/NISO Z39.104-2022, CRediT, Contributor Roles Taxonomy*, NISO, 14 de gener de 2022, https://doi.org/10.3789/ansi.niso.z39.104-2022.

ANNEX 1. RELATIONSHIP BETWEEN DEGREE LEARNING OUTCOMES, MINISTERIAL COMPETENCIES AND CanMEDS ROLES

Learning Outcome	Ministerial Competence	Medical expert	Communicator	Collaborator	Leader	Health Advocate	Scholar	Professional
LO 71	C1							■
LO 73	C1							■
LO 74	C1							■
LO 75	C2							■
LO 77	C2							■
LO 43	C3				■			
LO 72	C3							■
LO 78	C3							■
LO 79	C4							■
LO 80	C4							■
LO 57	C5						■	
LO 58	C5						■	
LO 59	C5						■	
LO 60	C5						■	
LO 38	C6			■				
LO 40	C6			■				
LO 1	C7	■						
LO 2	C7	■						
LO 3	C7	■						
LO 4	C7	■						
LO 5	C7	■						
LO 6	C8	■						
LO 7	C9	■						
LO 8	C9	■						
LO 9	C10	■						
LO 10	C10	■						
LO 11	C11	■						
LO 20	C12	■						
LO 26	C13		■					
LO 12	C13	■	■					
LO 13	C14	■						
LO 14	C14	■						
LO 16	C15	■						
LO 17	C15	■						
LO 18	C16	■						
LO 21	C16	■						
LO 22	C16	■						
LO 19	C17	■						
LO 23	C17	■						

Learning Outcome	Ministerial Competence	Medical expert	Communicator	Collaborator	Leader	Health Advocate	Scholar / Scientist	Professional
LO 24	C18	■						
LO 25	C18	■						
LO 49	C19					■		
LO 55	C19					■		
LO 76	C20							■
LO 45	C20				■			
LO 32	C21		■					
LO 33	C21		■					
LO 27	C21		■					
LO 15	C21	■						
LO 28	C22		■					
LO 29	C22		■					
LO 34	C23 / C24		■					
LO 35	C23 / C24		■					
LO 36	C23 / C24		■					
LO 37	C23 / C24		■					
LO 50	C25					■		
LO 51	C25					■		
LO 52	C25					■		
LO 48	C26					■		
LO 56	C26					■		
LO 41	C27			■				
LO 39	C27			■				
LO 53	C28					■		
LO 54	C28					■		
LO 46	C29					■		
LO 47	C30					■		
LO 66	C31						■	
LO 67	C31						■	
LO 68	C31						■	
LO 44	C32				■			
LO 42	C32			■				
LO 30	C33		■					
LO 31	C33		■					
LO 61	C34						■	
LO 62	C34						■	
LO 63	C35						■	
LO 64	C35						■	
LO 69	C36						■	
LO 65	C36						■	
LO 70	C37						■	

ANNEX 2. LEARNING OUTCOMES FOR THE MODULES OF THE BACHELOR'S DEGREE IN MEDICINE

Module I: Morphology, Structure and Function of the Human Body (64 ECTS)

Scientific Foundations of Medicine

LO 1 (K). Describe the fundamental aspects of cellular morphology, physiology, proliferation and the cell life cycle, as well as the biochemistry and regulation of gene expression. *(C7)*

> **Module Learning Outcome (MLO) 1 (K). MLO 1 (K).** Explain the structure, function, excitability, communication, cell cycle, differentiation, and proliferation of cells.
> **MLO 2 (K).** Describe the mechanisms of genetic information storage, expression and regulation.
> **MLO 3 (K).** Outline the mechanisms of hereditary transmission.

LO 2 (K): Describe the structure, morphology and function of organs at the molecular, cellular and organ levels, and their organisation into human body systems in health, across different stages of life and in both sexes. *(C7)*

> **MLO 4 (K).** Describe embryonic development and organogenesis.
> **MLO 5 (K).** Describe the structure, morphology, function and organisation of organs and systems at the molecular, cellular, organ and system levels, including the integumentary, haematological, cardiovascular, gastrointestinal, musculoskeletal, reproductive, excretory and respiratory systems.
> **MLO 6 (K).** Explain the structure, morphology and regulatory mechanisms of the nervous and endocrine systems.
> **MLO 7 (K).** Describe the processes of growth, maturation, and ageing of organs and systems.

LO 3 (K): Describe the systems responsible for the control, regulation and integration of organ and system function and metabolism, as well as the mechanisms underlying homeostasis and adaptation. *(C7)*

> **MLO 8 (K).** Explain biomolecules, metabolism and its regulation and integration, and the fundamental principles of nutrition.
> **MLO 9 (K).** Describe the mechanisms of homeostasis and adaptation to the environment.
> **MLO 10 (K).** Describe the mechanisms of the immune response.

LO 4 (K): Identify the principles and technological basis of procedures used to examine the structure and function of the human body. *(C7)*

> **MLO 11 (S).** Use basic laboratory materials and techniques safely and correctly.
> **MLO 12 (S).** Use macroscopic, microscopic and imaging techniques to identify the morphology and structure of tissues, organs and systems.
> **MLO 13 (C).** Interpret laboratory test parameters and normal vital signs accurately.
> **MLO 14 (C).** Perform basic functional tests accurately and appropriately.
> **MLO 15 (K).** Outline the anatomical basis of the physical examination.

Module II: Social Medicine, Communication Skills and Introduction to Research. (30 ECTS)

The principles of the medical profession

LO 73 (K): Recognise the legal principles governing professional practice, including the rights and duties of patients and doctors. *(C1)*

LO 74 (K). Identify the general principles of the medical profession and the commitments inherent in medical professionalism for the practice of patient-centred medicine. *(C1)*

LO 75 (K). Identify the doctor's responsibilities as a scientist (towards science), as a clinician (towards patients), and as a professional (towards society). *(C2)*

LO 78 (S). Demonstrate respect for the patient's right to receive clear, accurate and timely information about their illness. *(C3)*

LO 57 (S). Take responsibility for personal learning and development, recognising one's potential contribution to the advancement of medicine. *(C5)*

LO 58 (S). Maintain professional competence through continuous self-directed learning, reflection, self-critique and self-evaluation. *(C5)*

Ethical principles.

LO 71 (K). Identify the ethical principles underpinning the medical profession. (C1)

LO 72 (C): Address ethical issues and implications in healthcare affecting patients within a changing healthcare context. *(C7)*

The doctor–patient relationship

LO 76 (C). Practise patient-centred medicine in a range of clinical and healthcare settings, commensurate with level of training and under appropriate supervision. *(C20)*

LO 77 (K). Establish a relationship of trust with patients, including confidentiality and professional secrecy. *(C2)*

LO 79 (C). Apply patient autonomy principles and support informed decision-making by providing sufficient, appropriate and understandable information to support informed choices. *(C4)*

LO 80 (C). Address social and cultural factors influencing healthcare, with particular attention to equality, diversity and inclusion. (C4)

Epidemiological data.

LO 53 (S). Obtain and use epidemiological data to support the surveillance, assessment and identification of population health status and health problems.

> **MLO 16 (S).** Perform simple statistical analyses using computer software.

LO 54 (S): Analyse epidemiological data, trends and risks to support decision-making and evidence-based health intervention proposals. (C28)

> **MLO 17 (K).** Explain the basic concepts of biostatistics.
> **MLO 18. (K).** Describe the application of biostatistical methods in the medical sciences.
> **MLO 19. (C)**. Interpret biostatistical data and results, including student-generated data and data reported in the scientific literature.

Preventive interventions and responsibility for prevention

LO 55 (C). Propose personalised preventive interventions tailored to the patient's clinical, psychological and socio-economic profile, based on current scientific recommendations. *(C19)*

> **MLO 20 (K).** Recognise the principles of preventive medicine and public health, including risk factors and disease prevention strategies.
> **MLO 21 (K).** Describe key health indicators, such as life expectancy, mortality, morbidity and disability, and their use in assessing population health.

LO 48 (C). Assume responsibility for the surveillance, prevention and protection against disease, injury and accidents at individual and community levels. *(C26)*

LO 56 (C): Propose strategies and interventions to maintain and promote health and well-being, including

actions to foster healthy environments at individual and community levels. *(C26)*

MLO 22 (K). Describe the processes of planning, implementing and evaluating health programmes.
MLO 23 (S). Develop health action plans and programmes based on population needs and epidemiological evidence.
MLO 24 (S). Apply the methods of preventive medicine and public health in practice.
MLO 25 (K). Recognise *(or: describe)* the principles and types of vaccination.

Risk factors and determinants of health

LO 49 (C): Propose risk factors and prevention strategies in different clinical contexts. *(C19)*

LO 50 (K). Identify intrinsic population health determinants, including age, sex, ethnicity and genetic factors. *(C25)*

LO 51 (K). Identify extrinsic determinants of health in the population, including lifestyle factors; psychosocial and community integration; social, occupational, and environmental contexts; the effects of climate change; and determinants arising from economic, social, cultural, and environmental policies, as well as their impact on the health–disease process at both individual and population levels. *(C25)*

LO 52 (S). Analyse relationships between population health determinants in specific contexts and their influence on the health–disease process. *(C25)*

Information sources.

LO 66 (K). Identify available and up-to-date clinical and biomedical information sources, including criteria for quality, validity and reliability. *(C31)*

LO 67 (S). Use clinical and biomedical information sources to obtain and communicate scientific and health information in a structured, rigorous manner, in accordance with legal and ethical principles. *(C31)*

LO 68 (C). Critically evaluate information obtained and assess the reliability of medical and biomedical information sources. *(C31)*

LO 69 (S). Select appropriate information sources for biomedical research tasks, identifying whether they originate from empirical studies, expert reviews, or generative artificial intelligence, among others. *(C36)*

The scientific method and evidence

LO 63 (K): Describe the principles of the scientific method and its importance for studying, preventing and managing disease based on evidence. *(C35)*

MLO 26 (K). Describe the principles governing clinical research and the main types of clinical trials.

LO 59 (S). Apply the scientific method in medical practice to ensure and improve quality of care. *(C5)*

LO 64 (S): Identify the limitations of applying the scientific method in medicine, given the difficulty of controlling all relevant variables and mechanisms. *(C35)*

LO 60 (S). Apply the best available scientific evidence to continuously improve medical practice. *(C5)*

LO 61 (S). Identify available evidence and its limitations in each professional context. *(C34)*

LO 62 (C). Conduct professional practice based on scientific evidence, demonstrating critical thinking, creativity and support for research. *(C34)*

LO 65 (C). Formulate research hypotheses to solve problems, applying the scientific method and critically integrating the reliability and scope of available information. *(C36)*

Interpersonal communication and active listening.

LO 32 (C). Listen actively to patients, demonstrating interest, respect and empathy, and attending to both

verbal and non-verbal communication. *(C21)*.

LO 33 (C). Formulate clear and relevant questions, adapting pace and approach to the patient's circumstances and needs to obtain meaningful information about symptoms, history and concerns. *(C21)*

LO 34 (C). Communicate clearly and effectively with patients and relatives, both orally and in writing, adapting language to the clinical, emotional and socio-cultural context. *(C23/C24)*

LO 35 (C). Apply interpersonal communication techniques that foster trust and empathy with patients and/or relatives, managing sensitive information and difficult situations appropriately. *(C23/C24)*

> **MLO 27 (C).** Apply effective communication strategies in emotionally challenging clinical situations, including breaking bad news, managing aggressive behaviour, and caring for critically ill or end-of-life patients.

Collection and recording of information

LO 26 (C). Gather relevant clinical information through effective communication with patients, relatives and other sources, considering their biopsychosocial circumstances and respecting autonomy and confidentiality. *(C13)*

LO 12 (C). Produce a structured, clear and accurate medical history, in paper or electronic format, coherently integrating the information obtained while ensuring patient data protection. *(C13)*

LO 27 (S). Synthesise information obtained from patients into a structured, coherent and clinically useful narrative. *(C21)*

LO 28 (S). Write medical histories and other medical records using clear, precise and comprehensible technical language, organising information into structured sections in accordance with clinical practice standards. *(C22)*

LO 29 (S). Record relevant patient data accurately in written or electronic systems, ensuring legibility, coherence and traceability. *(C22)*

LO 30 (K). Identify patient information recording systems that are accurate, legible, up-to-date and complete, and that comply with legal and ethical principles governing patient data management. *(C33)*

LO 31 (S). Use patient information recording systems appropriately and efficiently, respecting privacy and confidentiality for subsequent analysis and communication with patients, relatives and healthcare professionals. *(C33)*

Responsible use of resources.

LO 43 (S). Apply the principle of social justice in medical practice by promoting equity in the use of healthcare resources. *(C3)*

LO 44 (S). Use current information and communication technologies effectively in clinical, therapeutic, preventive and research activities, ensuring the confidentiality of patient information. *(C32)*

> **MLO 28 (S).** Use commonly employed professional software applications efficiently, including the appropriate use and interpretation of artificial intelligence tools.

LO 45 (C). Manage healthcare resources efficiently for the benefit of patient health, including material resources, diagnostic tests, technologies and medicines. *(C20)*

> **MLO 29 (K).** Explain the fundamental principles of health economics and health technology assessment.

Health systems and their regulation

LO 46 (K). Describe national and international health organisations and the contexts and conditions that influence the functioning and performance of different health systems. *(C29)*

LO 47 (K). Describe the regulatory and organisational principles of the National Health System, as well as current healthcare legislation and regulations, to ensure ethical, legal and context-aware professional practice. *(C30)*

Information sharing.

LO 37 (C). Communicate technical or scientific content orally, in writing, and through digital media with rigour, ethical integrity, and responsibility, adapting language, format, and digital channels to professional or public-facing contexts. *(C23/C24)*

MLO 30 (S). Prepare basic medical and legal documentation (e.g. reports and certificates) in accordance with confidentiality requirements and current legal regulations, including those relating to death certification.

Patient safety

MLO 31 (K). Describe methods for assessing the quality of healthcare delivery.
MLO 32 (K). Describe patient safety principles and strategies in healthcare.
MLO 33 (S). Apply quality standards and clinical guidelines to improve clinical outcomes and patient safety.

Module III: Human Clinical Training (100 ECTS)

Determinant factors in states of health and disease

LO 6 (K). Describe the biological, psychological and social foundations of human personality and behaviour, including potential alterations. *(C8)*

MLO 34 (K). Recognise psychiatric disorders across the different stages of life.
MLO 35 (K). Describe the fundamental principles of psychotherapy.

LO 7 (K). Identify the pathogenic and pathophysiological mechanisms of disease, including defence mechanisms, structural changes and clinical manifestations. *(C9)*

MLO 36 (K). Describe the principal dermatological conditions, including their assessment and management.
MLO 37 (K). Describe the principal ophthalmic conditions, including their assessment and management.
MLO 38 (K). Describe the principal ear, nose and throat conditions, including their assessment and management.
MLO 39 (K). Describe the principal cardiovascular conditions, including their assessment and management.
MLO 40 (K). Describe the principal respiratory conditions, including their assessment and management.
MLO 41 (K). Describe the principal gastrointestinal conditions, including their assessment and management.
MLO 42 (K). Describe the principal renal and urinary tract conditions, including their assessment and management.
MLO 43 (K). Describe the principal endocrine and nutritional conditions, including their assessment and management.
MLO 44 (K). Describe the principal central and peripheral nervous system conditions, including their assessment and management.
MLO 45 (K). Describe the principal musculoskeletal conditions, including their assessment and management.
MLO 46 (K). Describe the principal haematological conditions, including their assessment and

management.
MLO 47 (K). Describe the principal immunological conditions, including their assessment and management.
MLO 48 (K). Describe the fundamental principles of oncological conditions, including their assessment and management.
MLO 49 (K). Recognise the principal forms of poisoning and toxic exposure, including their assessment and management.

LO 9 (K). Identify biological, physical, mechanical and chemical agents, as well as immunological mechanisms that cause disease. *(C10)*

MLO 50 (K). Recognise the main infectious agents, their mechanisms of action, and describe the knowledge, diagnosis and management of major infectious diseases.

LO 10 (K). Identify determinants of health and processes involved in disease development. *(C10)*

LO 11 (K). Describe the effects of growth, development and ageing on individual health, disease, and social context. *(C11)*

MLO 51 (K). Describe the characteristics of pregnancy, childbirth and the puerperium, and the main gynaecological conditions.
MLO 52 (K). Describe methods of contraception and fertility, and sexually transmitted infections.
MLO 53 (K). Describe growth, development and nutrition during childhood and adolescence.
MLO 54 (K). Recognise the most relevant paediatric diseases.
MLO 55 (K). Explain the principles of genetic diagnosis and counselling.
MLO 56 (K). Recognise the characteristics of prevalent diseases in older adults.

LO 18 (C). Identify clinical situations posing immediate risk to life or requiring urgent intervention, appropriately interpreting warning signs and symptoms. *(C16)*

LO 25 (S). Plan palliative care interventions for patients in the terminal phase or at the end of life, promoting comfort and dignity, and involving patients and their families in therapeutic decision-making. *(C18)*

MLO 57 (K). Recognise the procedures and principles of palliative medicine.

LO 21 (S). Apply basic and advanced life-support measures according to established protocols. *(C16)*

MLO 58 (S). Design action plans in family and community medicine, integrating patient needs with their family and social environment.

Medical history and clinical examination.

LO 12 (C). Produce a structured, clear and accurate medical history, in paper or electronic format, coherently integrating the information obtained while ensuring patient data protection. *(C13)*

LO 28 (S). Write medical histories and other medical records using clear, precise and comprehensible technical language, organising information into structured sections in accordance with clinical practice standards. *(C22)*

LO 13 (S). Perform a complete and systematic physical examination adapted to the clinical context, using appropriate techniques correctly. *(C14)*

Preventive interventions and responsibility for prevention

LO 55 (C). Propose personalised preventive interventions tailored to the patient's clinical, psychological and socio-economic profile, based on current scientific recommendations. *(C19)*

LO 48 (C). Assume responsibility for the surveillance, prevention and protection against disease, injury and accidents at individual and community levels. *(C26)*

LO 56 (C): Propose strategies and interventions to maintain and promote health and well-being, including

actions to foster healthy environments at individual and community levels. *(C26)*

MLO 22 (K). Describe the processes of planning, implementing and evaluating health programmes.
MLO 23 (S). Develop health action plans and programmes based on population needs and epidemiological evidence.
MLO 24 (S). Apply the methods of preventive medicine and public health in practice.
MLO 25 (K). Recognise *(or: describe)* the principles and types of vaccination.

Module IV: Diagnostic and Therapeutic Procedures (40 ECTS)

Diagnostic judgement

LO 17 (C). Establish a differential diagnosis and a reasoned diagnostic strategy appropriate to the patient's clinical situation, considering effectiveness, cost-effectiveness and procedural safety. *(C15)*

MLO 59 (S). Select indications for biochemical, haematological, immunological, microbiological, anatomical-pathological, imaging and electrophysiological tests according to the clinical situation.

LO 5 (S). Integrate advances in the biomedical sciences into knowledge acquisition and clinical practice. *(C7)*

MLO 60 (S). Process biological samples for diagnostic purposes.

LO 20 (K). Explain the principles of action, technological basis, indications, and effectiveness of therapeutic interventions in accordance with available scientific evidence. *(C12)*

MLO 61 (K). Explain the general principles of anaesthesia and resuscitation in clinical contexts.
MLO 62 (S). Apply radiological protection criteria in diagnostic and therapeutic procedures involving ionising radiation.

LO 22 (C). Prioritise urgent clinical interventions, applying safety criteria in the use of available resources. *(C16)*

LO 23 (C). Propose an individualised treatment plan based on the best available evidence, focused on patient safety, clearly explaining potential risks, benefits and alternative options. *(C17)*

MLO 63 (S). Apply basic knowledge of nutrition and dietetics in the prevention and treatment of diseases.

LO 24 (S). Select the most appropriate pharmacological and non-pharmacological treatments for common acute and chronic conditions, in accordance with scientific evidence and current clinical recommendations. *(C18)*

MLO 64 (S). Identify the main drug groups and their mechanisms of action.
MLO 65 (K). Describe the dosages, routes of administration and pharmacokinetics of commonly used drugs.
MLO 66 (K). Recognise clinically relevant drug interactions and adverse reactions.
MLO 67 (S). Apply principles of safe prescribing and pharmacovigilance in clinical practice.

LO 25 (S). Plan palliative care interventions for patients in the terminal phase or at the end of life, promoting comfort and dignity, and involving patients and their families in therapeutic decision-making. *(C18)*

LO 8 (K). Identify deviations from normal laboratory values and from basic functional and imaging tests, and their possible causes. *(C9)*

MLO 68 (C). Interpret biochemical, haematological, cytogenetic and molecular biology markers in the context of clinical diagnosis.
MLO 69 (S). Perform microbiological and parasitological diagnostic techniques, evaluating and interpreting their results.
MLO 70 (S). Analyse histopathological alterations and anatomical pathology of the various organs and

systems in cases of injury, adaptation, cell death, inflammation and abnormal cell growth.

MLO 71 (C). Interpret radiological and other diagnostic imaging studies, recognising the basic semiology of different organs and systems.
MLO 72 (S). Perform electrophysiological tests, such as ECG and EEG, interpreting the main findings.

Therapeutic procedures

MLO 73 (C). Assess preoperative risks and potential postoperative complications.

MLO 74 (S). Perform disinfection and sterilisation techniques.

MLO 75 (C). Perform basic surgical procedures, including cleaning, haemostasis and wound suturing, following appropriate safety and technical standards.

MLO 76 (K). Describe the pathophysiology of wounds and the processes of tissue repair and healing.

MLO 77 (K). Explain the principles of transfusions and organ transplantation.

MLO 78 (K). Identify the principles and indications of radiotherapy in different clinical contexts.

MLO 79 (S). Apply the principles of rehabilitation, promotion of personal autonomy and functional adaptation of the environment to improve quality of life.

Module V: Supervised Clinical Placements and Final Degree Project (60 ECTS)

Medical history and clinical examination.

LO 12 (C). Produce a structured, clear and accurate medical history, in paper or electronic format, coherently integrating the information obtained while ensuring patient data protection. *(C13)*

LO 13 (S). Perform a complete and systematic physical examination adapted to the clinical context, using appropriate techniques correctly. *(C14)*

LO 14 (S). Assess the patient's mental and cognitive status using appropriate techniques and instruments. *(C14)*

Diagnostic judgement

LO 15 (S). Interpret the clinical significance of information provided by the patient, considering their biopsychosocial context. *(C21)*

LO 16 (C). Formulate an initial diagnostic judgement based on clinical data from the medical history, physical examination and complementary tests. *(C15)*

LO 17 (C). Establish a differential diagnosis and a reasoned diagnostic strategy appropriate to the patient's clinical situation, considering effectiveness, cost-effectiveness and procedural safety. *(C15)*

LO 18 (C). Identify clinical situations posing immediate risk to life or requiring urgent intervention, appropriately interpreting warning signs and symptoms. *(C16)*

LO 19 (C). Establish a definitive diagnosis and theoretical prognosis, integrating available clinical and scientific information and applying rigorous clinical reasoning. *(C17)*

Therapeutic plan and clinical practice

LO 20 (K). Explain the principles of action, technological basis, indications, and effectiveness of therapeutic interventions in accordance with available scientific evidence. *(C12)*

LO 21 (S). Apply basic and advanced life-support measures according to established protocols. *(C16)*

LO 22 (C). Prioritise urgent clinical interventions, applying safety criteria in the use of available resources. *(C16)*

LO 23 (C). Propose an individualised treatment plan based on the best available evidence, focused on patient safety, clearly explaining potential risks, benefits and alternative options. *(C17)*

LO 24 (S). Select the most appropriate pharmacological and non-pharmacological treatments for common acute and chronic conditions, in accordance with scientific evidence and current clinical recommendations. *(C18)*

LO 25 (S). Plan palliative care interventions for patients in the terminal phase or at the end of life, promoting comfort and dignity, and involving patients and their families in therapeutic decision-making. *(C18)*

Information gathering and documentation.

LO 26 (C). Gather relevant clinical information through effective communication with patients, relatives and other sources, considering their biopsychosocial circumstances and respecting autonomy and confidentiality. *(C13)*

LO 12 (C). Produce a structured, clear and accurate medical history, in paper or electronic format, coherently integrating the information obtained while ensuring patient data protection. *(C13)*

LO 27 (S). Synthesise information obtained from patients into a structured, coherent and clinically useful narrative. *(C21)*

LO 28 (S). Write medical histories and other medical records using clear, precise and comprehensible technical language, organising information into structured sections in accordance with clinical practice standards. *(C22)*

LO 29 (S). Record relevant patient data accurately in written or electronic systems, ensuring legibility, coherence and traceability. *(C22)*

LO 30 (K). Identify patient information recording systems that are accurate, legible, up-to-date and complete, and that comply with legal and ethical principles governing patient data management. *(C33)*

LO 31 (S). Use patient information recording systems appropriately and efficiently, respecting privacy and confidentiality for subsequent analysis and communication with patients, relatives and healthcare professionals. *(C33)*

Interpersonal communication and active listening.

LO 32 (C). Listen actively to patients, demonstrating interest, respect and empathy, and attending to both verbal and non-verbal communication. *(C21)*.

LO 33 (C). Formulate clear and relevant questions, adapting pace and approach to the patient's circumstances and needs to obtain meaningful information about symptoms, history and concerns. *(C21)*

LO 34 (C). Communicate clearly and effectively with patients and relatives, both orally and in writing, adapting language to the clinical, emotional and socio-cultural context. *(C23/C24)*

LO 35 (C). Apply interpersonal communication techniques that foster trust and empathy with patients and/or relatives, managing sensitive information and difficult situations appropriately. *(C23/C24)*

> **MLO 27 (C).** Apply effective communication strategies in emotionally challenging clinical situations, including breaking bad news, managing aggressive behaviour, and caring for critically ill or end-of-life patients.

Information exchange

LO 36 (C). Exchange information accurately and respectfully with other healthcare professionals, promoting teamwork and shared decision-making. *(C23/C24)*

LO 37 (C). Communicate technical or scientific content orally, in writing, and through digital media with rigour, ethical integrity, and responsibility, adapting language, format, and digital channels to professional or public-

facing contexts. *(C23/C24)*

Role development.

LO 41 (K). Identify one's roles and responsibilities within multidisciplinary and multiprofessional teams across a range of care settings, in the delivery of clinical and care activities and in health promotion and maintenance interventions, reinforcing individual accountability and professional commitment. *(C27)*

LO 38 (C). Develop professional practice grounded in an understanding and recognition of the competencies of each health profession within a multiprofessional environment, promoting appropriate task allocation and efficient time management. *(C27)*

LO 39 (C). Effectively fulfil one's responsibilities within multidisciplinary and multiprofessional teams, including, where appropriate, assuming leadership roles, and promoting autonomous practice, shared responsibility, and shared decision-making. *(C27)*

Teamwork

LO 40 (C). Develop effective teamwork based on mutual trust and respect among colleagues and team members, recognising the benefits of collaborative and complementary working as a key factor in enhancing collective performance. *(C6)*

LO 39 (C). Effectively fulfil one's responsibilities within multidisciplinary and multiprofessional teams, including, where appropriate, assuming leadership roles, and promoting autonomous practice, shared responsibility, and shared decision-making. *(C27)*

LO 42 (S). Use information and communication technology tools to facilitate remote professional collaboration and teamwork, complying with ethical, security, privacy, and data protection standards. *(C32)*

Ethical principles

LO 71 (K). Identify the ethical principles underpinning the medical profession. *(C1)*

LO 72 (C): Address ethical issues and implications in healthcare affecting patients within a changing healthcare context. *(C7)*

Principles of the medical profession

LO 73 (K): Recognise the legal principles governing professional practice, including the rights and duties of patients and doctors. *(C1)*

LO 74 (K). Identify the general principles of the medical profession and the commitments inherent in medical professionalism for the practice of patient-centred medicine. *(C1)*

LO 75 (K). Identify the doctor's responsibilities as a scientist (towards science), as a clinician (towards patients), and as a professional (towards society). *(C2)*

Doctor–patient relationship

LO 76 (C). Practise patient-centred medicine in a range of clinical and healthcare settings, commensurate with level of training and under appropriate supervision. *(C20)*

LO 77 (C). Establish a relationship of trust with patients, including confidentiality and professional secrecy. *(C2)*

LO 78 (S). Demonstrate respect for the patient's right to receive clear, accurate and timely information about their illness. *(C3)*

LO 79 (C). Apply patient autonomy principles and support informed decision-making by providing sufficient, appropriate and understandable information to support informed choices. *(C4)*

LO 80 (C). Address social and cultural factors influencing healthcare, with particular attention to equality,

diversity and inclusion. *(C4)*

Introduction to research

LO 70 (C). Conduct a basic research activity to complete a project or study, applying the scientific method and acquired research tools. *(C37)*

ANNEX 3. RELATIONSHIP BETWEEN EPAs (AAMC) AND MEDICAL ROLES (CANMEDS)

EPA (AAMC)	Description	Roles
EPA 1	Gather a history and perform a physical examination.	*medical expert, communicator, professional*
EPA 2	Prioritise a differential diagnosis following a clinical encounter. Gather a medical record and perform a physical examination	*medical expert, scholar/scientist*
EPA 3	Recommend and interpret common diagnostic and screening tests	*medical expert, scholar/scientist*
EPA 4	Enter and discuss orders and prescriptions.	*medical expert, leader, professional*
EPA 5	Document a clinical encounter in the patient record	*communicator, medical expert, professional*
EPA 6	Provide an oral presentation of a clinical encounter	*communicator, collaborator*
EPA 7	Form clinical questions and retrieve evidence to advance patient care	*medical expert, communicator, collaborator, leader, professional*
EPA 8	Give or receive a patient handover to transition care responsibility	*medical expert, professional*
EPA 9	Collaborate as a member of an interprofessional team.	*collaborator*
EPA 10	Recognise a patient requiring urgent or emergent care and initiate evaluation and management.	*leader, professional, scholar/scientist, collaborator*
EPA 11	Obtain informed consent for tests and/or procedures	*communicator, professional, health advocate*
EPA 12	Perform general procedures of a physician	*communicator, collaborator*
EPA 13	Identify system failures and contribute to a culture of safety and improvement	*Scholar/scientist, professional*

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