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#### **REVIEW**

### The teaching of legal and forensic medicine in Spain



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undergraduate teaching in medical schools has generally lost in quantitative importance compared to previous curricula. However, postgraduate training, and in particular, the specialty of legal and forensic medicine in residency training, has made very significant progress. A 4-year specialisation, with rotations in the Institutes of Legal Medicine and Forensic Sciences and the subsidised health centres, should provide the necessary training for future forensic doctors in Spain.

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Abstract The teaching of legal and forensic medicine in Spain is undergoing a period of

profound change. With the implementation of the new curricula based on the "Bologna Plan",

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#### **PALABRAS CLAVE**

Medicina Legal y Forense; Educación Médica; Especialidad Medicina Legal y Forense

#### La enseñanza de la medicina legal y forense en España

**Resumen** La enseñanza de la Medicina Legal y Forense en España se encuentra en un periodo de cambio profundo. Con la aplicación de los nuevos planes de estudio basados en el "Plan Bolonia", la enseñanza de pregrado impartida en las facultades de medicina ha perdido en general importancia cuantitativa respecto a los planes de estudio previo. Por contra, la enseñanza postgraduada, y específicamente la especialidad de Medicina Legal y Forense en régimen de residencia, ha supuesto un avance muy significativo. Una especialidad de cuatro

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años, con rotatorios en los IMLCF y en los centros sanitarios concertados, debe proporcionar la formación necesaria para los futuros médicos forenses en España.

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The teaching of legal and forensic medicine has logically kept pace with technological development and social demand. In Spain, this teaching began in the 17th century. although it did not become consolidated as an academic discipline until the 19th century, a period in which specific chairs in legal and forensic medicine were created and its teaching was formalised. The driving force behind this process was undoubtedly Pedro Mata y Fontanet, who not only drove the creation of Chairs of Legal and Forensic Medicine in Madrid and Barcelona, the first of which he occupied for many years, but also contributed to the creation of the Cuerpo Nacional de Médicos Forenses (National Corps of Forensic Doctors). 1 In the transition from the 19th to the 20th century, the development of forensic medicine and its teaching was marked by figures such as Tomás Maestre and Antonio Lecha Marzo, developed through the professional college system.

Focussing primarily on the teaching of legal and forensic medicine in Spain, the approach must distinguish between 2 different contexts: teaching during medical studies (undergraduate or postgraduate), and postgraduate teaching. This postgraduate teaching has traditionally been very diverse, including monographic courses in different areas (anthropology, body damage assessment, forensic toxicology, etc.), both official and unofficial. Among the official courses (university master's degrees), we can highlight those offered by the Complutense University of Madrid, the University of Barcelona, the University of Valencia, or the University of Alicante, among others. And among the monographic courses, we should highlight those dedicated to bodily injury assessment and forensic anthropology, due to their long teaching tradition. In this paper, however, we will focus mainly on the teaching of the specialty of legal and forensic medicine.

# The teaching of legal and forensic medicine in the medicine degree

With regard to the teaching of the former and the current medicine degree, we can only point out the most important changes that have taken place in recent years and the varied current situation. The classic situation of undergraduate teaching in forensic medicine was a single subject that grouped contents under forensic medicine and was usually taught in the last year of the degree.

However, the transition to the new curricula derived from the "Bologna Plan" to form the European Higher Education Area brought profound changes to the subject from 2010. Firstly, the teaching load has been distributed in ECTS (European Credit Transfer and Accumulation System) credits, which, depending on the university, correspond to

periods of 25–30 h of student work.<sup>3</sup> These hours of student work are normally divided, again depending on the university, into 3 periods of 10 h each; theoretical teaching. practical teaching, and hours of student work. The teaching load assigned to the subject of legal and forensic medicine also depends on the university, but is limited to a range of between 6 and 9 ECTS credits. However, the organisation and distribution of these credits, depending on the university autonomy, has led to many different situations, some of which are difficult to explain from a teaching perspective.4 In many cases, the number of teaching credits for the subject has been reduced, or combined with the contents of other related subjects such as ethics or clinical toxicology.<sup>5</sup> In some universities, legal and forensic medicine is even taught in the first year of medicine. This leads to an absurd situation from a teaching point of view, since students do not have the necessary prior knowledge to understand medical legal problems, nor are they aware of the legal dilemmas associated with a medical practice with which they are not yet familiar. Unfortunately, the importance given by some curricula to legal and forensic medicine is related to the percentage of questions on the subject in the MIR exam. And these data, apart from varying from year to year, do not seem to constitute a serious teaching criterion.

Another obvious change in the curricula is the increased emphasis on the legal aspects of healthcare topics (medical history, confidentiality, informed consent, professional liability, etc.) at the expense of traditional forensic topics. This is a logical development given the current situation of the increase in legal claims against doctors, but it still undervalues an important part of forensic medical knowledge.

# The teaching of the specialty of legal and forensic medicine through the residency system

There have been important and encouraging changes in the teaching of legal and forensic medicine in recent years.<sup>6,7</sup> After years of teaching the specialty through the college system, training through the residency system began in 2021.<sup>8,9</sup> This change means that students, even after the MIR exam,<sup>10</sup> will be formatively dependent on an Institute of Legal Medicine and Forensic Medicine, and their salaries will be paid mainly by the Justice Departments of the Autonomous Communities with devolved competences, or by the Ministry of Justice in the case of those without. This new situation also implies the existence of a system of total incompatibility, similar to that of MIR residents in clinical specialties. It should be remembered that students trained in forensic medicine colleges were not trained on an

exclusive basis, but neither did they did receive a salary (and they also had to pay tuition fees to the university to which the college was attached).

The new training plan is set out in Royal Decree 704/2020 of 28 July, which regulates access to the qualification of specialist in legal and forensic medicine through the residency system. This residency training will last 4 years and will be organised and supervised by the accredited teaching units of the Institutes of Legal Medicine and Forensic Sciences (IMLCF). It is envisaged that approximately one-third of this period will be spent in teaching health centres, mainly hospitals. It is therefore a mixed clinical—legal system that aims to provide comprehensive training for the future specialist in forensic and legal medicine. 9

Royal Decree 589/2022 of 19 July, <sup>12</sup> regulates the transversal training of specialties in health sciences, the procedure and criteria for the proposal of a new qualification of specialist or diploma in a specific training area, and the revision of those established, and access to and training of areas of specific training; and it establishes the rules applicable to the annual tests for access to training places in specialties in health sciences.

This RD abolished the distribution of training years over a period of 2 years in healthcare teaching facilities within the 4-year training period, in considering that the period of rotations/training placements in other specialties should be less than 30%. In fact, the fifth and final provision expressly amends Royal Decree 704/2020 of 28 July. As a result, 1 year of the 4-year training period takes place in the healthcare teaching facilities with which there is an agreement or arrangement and the remaining 3 years in the accredited teaching units of the IMLCF.

The complete training for the specialty is set out in the POE (Official Programme of the Speciality), which is contained in Order PCM/997/2022.<sup>13</sup> This document, proposed by the National Commission of the Specialty, contains the definition of the specialty of legal and forensic medicine, its objectives and areas of activity, and, above all, the areas and duration of training, as well as the requirements for the accreditation of teaching units.

These requirements are set out in Annex II of the Order and require:

- Teaching structure (teaching committee, director of studies, accredited tutors for the specialty, specialty assessment committees, teaching quality management plan, teaching resources—digital clinical records, meeting rooms, audiovisual resources, virtual library, skills laboratory, etc.).
- Application of the teaching programme for the specialty (training plan, resident assessment plan, resident supervision protocol, etc.).
- Specific protocols (health organisation, human resources, physical area—forensic clinic, forensic pathology, forensic laboratory, administrative area and meeting room, appropriate equipment, etc.).
- Care activity/outcomes (minimum annually).
- Efficiency and quality indicators (percentage of telematic actions, percentage of training, research and teaching activities on family, minors, people with disabilities, and

- gender and domestic violence, or other, percentage of complaints and suggestions received on the functioning of the unit, and responded to).
- Teaching facilities (of different ownership to those of the centre or accredited teaching unit).
- Research (annual publication at least in journals of the specialty in the last 2 years, annual presentation or communication in national conferences and congresses in the last 2 years, research projects with evaluation in the last 5 years).
- Commitment to teaching (continuous compliance with accreditation criteria, periodic assessment, adaptation of the training guide or itinerary to the resident, etc...).
- Definition of requirements to increase the maximum teaching capacity (the above requirements will accredit the unit to teach one resident per year, 100% more of these requirements will accredit the unit to teach 2 residents per year). The participation of the residents in the research projects of the teaching unit must be accredited.

The Order<sup>13</sup> defines the specialty of legal and forensic medicine as "the medical specialty of the medical and social disciplines that provides competence in solving legal problems by applying the methods and knowledge of medicine through observation, documentation, collection, evaluation, and interpretation of evidence in the context of clinical and post-mortem examinations required in the various fields of law". And, it defines its main objectives as "the study of the cause and circumstances of death and the expert assessment of physical and psychological injuries", also mentioned as "other areas of activity toxicology, psychiatry, genetics, and forensic anthropology and advice on legal and bioethical issues".

The training of resident doctors is logically based on a system of progressive acquisition of competences. And among the competences sought, a distinction is made between the "transversal competences of the health science specialties", which are common to all, and the "specific competences of the specialty of legal and forensic medicine".

#### Teaching by competences

The "transversal competences of the health sciences" are grouped into 13 competences listed in Table 1. Of these, it should be noted that the second (principles of bioethics) and the third (legal principles applicable to the practice of health science specialties) are also dealt with extensively in the training of the specialty itself. <sup>14</sup>

The POE focuses on the "specific competencies of the specialty of legal and forensic medicine" and groups them into 6 domains (Table 2), each with its own set of competences, which will be discussed in more detail below.

The first domain is called "General Competences" and is quite heterogeneous. It is made up of 10 competences that include aspects such as applying the principles of bioethics to forensic practice, writing expert reports, using computer applications and literature resources, communication skills, and general knowledge of the different official bodies in relation to their activities (Observatory against Domestic

**Table 1** Transversal competences in health sciences.

#### N.° Domain

- 1 Commitment to the principles and values of the health science specialties
- 2 Principles of bioethics
- 3 Legal principles applicable to the practice of health science specialties
- 4 Clinical communication
- 5 Teamwork
- 6 General clinical skills applicable to the practice of health science specialties
- 7 Management of medicines and other therapeutic resources
- 8 Equity and social determinants of health
- 9 Health promotion and prevention
- 10 Digital health
- 11 Research
- 12 Teaching and training
- 13 Clinical and quality management

and Gender Violence, Spanish Observatory on Drugs and Addiction, Early Warning System on Drugs, etc.). The context of this learning will be the IMLCF, where the resident's teaching unit is located. For example, residents will have to write a minimum of 100 reports and prepare the communication of at least 10 cases for presentation in oral proceedings.

The second domain, "Medical Legal and Forensic Clinic", is logically one of the largest, with 30 competences, probably covering most of the specific tasks of a forensic doctor in an examining magistrate's court. Within this domain, the first 7 competences relate to traumatology and rehabilitation: knowledge of the aetiology, clinical and imaging diagnosis, and therapeutic alternatives of the different trauma pathologies, as well as knowledge of rehabilitation and physical and functional therapies, and the expected results of these procedures. These competences must be acquired in the IMLCF and in the departments of orthopaedic surgery and traumatology, radiodiagnostics, and physical medicine and rehabilitation of mixed private—public funded hospitals.

This second domain also includes the management of emergency pathologies (logically to be acquired in the emergency services of private—public funded hospitals) and the most common medical pathologies related to the practice of forensic medicine. It also includes a specific competence on the medical care of those detained in judicial custody.

**Table 2** Specific competences of the specialty of legal and forensic medicine.

N.°	Domain
1	General competences
2	Medical legal and forensic clinic
3	Legal and forensic psychiatry
4	Forensic pathology
5	Forensic laboratory
6	Medical law, health legislation, and clinical ethics

Another specific chapter is devoted to the detection of intoxication and addiction to various substances, the appropriate interpretation of diagnostic tests, and the establishment of clinical—analytical relationships.

There are a number of competences related to the detection of cases of abuse of all kinds in the most vulnerable groups of the population and to the assessment of the risk to which they are exposed. A particular aspect in this respect is the determination of the age of unaccompanied minors, an aspect that often raises doubts that are difficult to resolve and that has major implications for the management of cases. This is a difficult determination that requires considerable knowledge of children's bone development, dental maturation, and radiodiagnostics.

Also included in this second domain are the competences related to the determination of injuries and sequelae resulting from road traffic accidents (for drafting expert reports at the request of individuals to the IMLCF), the assessment of incapacity, disability (for access to certain social benefits), the work capability assessment, and using the most common scales for the assessment of bodily injury in its different aspects (and, in particular, the scale for bodily injury sustained in road traffic accidents included in Law 35/2015).

The POE requires 5–10 cases of each of these types of reports.

The third domain specific to the specialty of legal and forensic medicine would be "Legal and Forensic Psychiatry". This is also a large domain that includes 28 different specific competences. It includes competences in psychiatric interviewing and diagnosis, the use of complementary tests (knowing their limitations), and the impact of different diagnoses on forensic medical problems. Obviously, there are also different competences for assessing the capacity and responsibility of people with mental disorders and for assessing their testimony in court. Particular reference should be made to situations of involuntary admission and supervision.

Other aspects of these psychiatric competences would be the study of the vulnerability of the mentally ill to crime. And also, the psychological and psychiatric consequences of crime victims.

This domain includes 4 competences related to child and adolescent mental health: most common pathologies and treatments, psychological damage suffered as a victim, analysis of maturity, and the study of crimes committed by mentally ill minors.

Another skill to be acquired, of great importance in forensic medical practice, would be the assessment of the risk of suicide, especially in the case of persons deprived of their liberty.

The assessment of psychological sequelae, and of capacity and disability according to different scales is also included in this third domain.

Logically, all these forensic psychiatry competences must be acquired in the consultations of the IMLCF itself and in the rotations carried out in the psychiatric services of the mixed private—public hospitals and centres.

The POE requires between 5 and 20 cases, depending on the type of report.

The fourth area of specific competences is "Forensic Pathology" and includes 22 specific competences.

The first competences logically focus on the diagnosis of death and its possible causes. This includes the ability to correctly examine the body and obtain data to establish the time of death and its possible medical legal aetiology. And also obtaining data to formulate a hypothesis of identity, if possible.

The second group of competences in this field is aimed at correctly performing autopsies according to the state of the body, knowing how to identify the most common causes of death, and correctly taking the necessary histological samples. All this must also be translated into an autopsy report (first provisional, then definitive) with sufficient scientific rigour.

In the case of extensive deterioration of remains, forensic anthropological procedures must be known to determine sex, age, ethnic pattern, and other physical characteristics (or other marks) to identify and determine the cause of death. There are also specific competences to train the forensic anthropologist in multiple victim or human rights cases.

For example, the POE requires 30 cases of intervention in the removal of corpses and the performance of 30 autopsies and their reports.

The fifth area, "Forensic Laboratory", includes a number of competences related to sample collection, informed consent form, and other documentation to be completed, sample preservation and submission to the laboratory to ensure chain of custody.

Another set of competences will enable the main diagnostic tools of the toxicology laboratory to be determined, and evaluation of the results obtained in relation to the medical legal problem posed: causes of death, non-fatal clinical intoxications, influence of toxic substances on behaviour, etc.

This domain would also include forensic genetics skills: taking samples, basic knowledge of laboratory techniques, and applying the results to problems of paternity or determining the identity of a person or cadaver. Finally, there would be skills aimed at laboratory examinations in cases of sexual aggression; and specific examinations of hair samples, blood stains, or other fluids found during the removal of the corpse.

This laboratory training should be acquired in IMLCF with sufficient facilities, or otherwise in the National Institute of Toxicology and Forensic Sciences.

In this fifth domain, the POE requires 25 reports on the interpretation of results in cases of drug intoxication, 5 cases on the interpretation of genetic data, or 5 cases on the examination of samples taken in cases of sexual offences.

And the sixth domain refers to competences in "Medical Law, Health Legislation, and Clinical Ethics". This is a heterogeneous domain that includes, among other things, competences relating to the organisation of justice administration and the role of forensic medicine. It includes a range of competences relating to the application of bioethical principles to specific dilemmas, the participation of forensic doctors in clinical and research ethics committees, 15 and knowledge of medical deontology and its application. It also includes competences related to medical legal knowledge in healthcare (informed consent, confidentiality and secrecy, professional responsibility, medical legal documents, etc.), medical research on humans, and medical legal problems at the beginning and end of life. Finally, it

includes competences related to the legal regulations governing the handling of corpses and cadavers.

#### Organisation of training placements

The training system is very similar to that of other medical specialties in the Spanish national health system. Skills are acquired over a 4-year training period, with rotations mainly at the IMLCF and at health centres with which training agreements have been signed.

The acquisition of competences and responsibilities will be progressive, in accordance with RD 183/2008, <sup>16</sup> and therefore residents in the final years will be able to carry out effective forensic work.

The organisation of the rotations is provided for in the POE (Official Programme of the Specialty), although it may be partially modified depending on the agreements in force and the availability of the different IMLCFs.

The rotations specified in the POE mark a first year of mainly hospital-based training, with rotations in orthopaedic surgery and traumatology, rehabilitation, radiodiagnostics, psychiatry, family and community medicine, and pathological anatomy. This first year also includes out-of-hospital rotations in the reference IMLCF and in the medical units of the INSS and the EVI (Disability Assessment and Orientation Teams).

The second year also includes hospital rotations (gynae-cology and obstetrics, and especially psychiatry), although most of these take place in the reference IMLCF.

The third year is mostly spent in the IMLCFs and is dedicated to forensic pathology (combined with the anatomical pathology services of the hospital) and the forensic laboratory (in the IMLCFs that have facilities and at the National Institute of Toxicology for more specialised aspects).

And, the fourth and final year is devoted almost exclusively to forensic medicine and forensic clinics in the IMLCFs and courts. This last year includes an optional rotation, which could be in an external centre with which there is an agreement, such as hospital forensic medicine services or forensic medicine schools specialising in certain areas (forensic anthropology, professional responsibility, bioethics, etc.).

Royal Decree 589/2022<sup>12</sup> stipulates in its Annex I that training in a specialty cannot be based on rotations/training placements in other specialties. Therefore, in the programme of the specialisation in legal and forensic medicine, the period of rotations/training placements in other specialisations must also be less than 30%, which made it necessary to introduce slight modifications to the original programme of the specialisation.

#### Monographic courses for doctors of the Cuerpo Nacional de Médicos Forenses (National Corps of Forensic Doctors)

A special aspect of training in legal and forensic medicine, specific to forensic doctors, consists of the training courses organised by the forensic medicine institutes themselves. For example, in the Autonomous Community of Catalonia,

the IML has held 2 training courses in forensic psychiatry in 2004 and 2014, and the third edition is currently underway. 17,18,19

#### Conclusion

In conclusion, the teaching of legal and forensic medicine is undergoing a process of transformation. And, in very different situations, depending on whether we are talking about undergraduate or postgraduate teaching.

While at the undergraduate level the quantitative importance of legal and forensic medicine has declined, at the postgraduate level the situation has clearly improved. The new specialty of legal and forensic medicine within the residency system should provide a comprehensive and complete training for future specialists, far superior to that of the old schools. And, this system will be complete when the professional needs of the Cuerpo Nacional de Médicos Forenses and coroners can be met by the residents completing the specialty each year. <sup>20</sup> All that is needed is the accreditation of the teaching units in the Autonomous Communities that have not yet joined the process.

We fully agree with Grijalba, Arimany, Barbería, and Xifró's positive assessment of the change in the training system.<sup>21</sup>

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