

## *In Focus: Pharmacy in Spain*

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The separation of the profession of Medicine from that of Pharmacy occurred in Spain during the early Middle Ages. This distinction did not come about in other advanced nations until four or five centuries later.

From medieval times until the end of the eighteenth-century, becoming a pharmacist in Spain meant the initial acquirement of both practical and scientific knowledge. It was then necessary to pass an exam controlled by either professional peers or the "Protomedicato Tribunal" (Original in Spanish).

In 1650, Philip IV declared pharmacy to be a "Scientific Art", and in 1780 Charles III founded the first higher education center for science in Madrid, which featured a distinctive branch of pharmaceutical studies. The "Protomedicato Tribunal" was also divided into three different areas during this period: Pharmacy, Medicine and Surgery.

The advances in pharmaceutical studies at this time prompted the creation of the first official university chairs in Botany and Chemistry, established in Madrid.

In 1800, the Superior Governing Board of Pharmacy was instituted to organize everything

that had to do with Pharmacy, both in management as well as in scientific areas. Initially, pharmacists were trained in the combined Medicine and Surgery Faculties. They offered two years of theory and two more years of practical, "hands-on" learning. This programme was short-lived, however. In 1804, the Academic Pharmacy Ordinance, regulated by the Faculties of Pharmacy and directed by the Superior Governing Board, came into effect.

The Faculties of Pharmacy (Madrid, 1806; Barcelona, 1808; Santiago y Seville, 1815) divided the programme and requisite coursework into three years and included subjects in Natural History, Chemistry and Pharmacy (concentrating on biochemistry).

In 1815, a degree in Pharmacy took four years, focusing on subjects like Pharmaceutical Materials and Experimental Pharmacy. At this time, the study of Physics was added to the curriculum.

A quarter of a century later, in 1843, the time needed to complete the degree was increased to five years. Pharmaceutical studies were conjoined with those of Medicine and the title of "doctor" came into usage, replacing that of

"bachelor". Under these auspices, two new subjects were added: Chemical Manipulation and Operative Pharmaceutical Chemistry. Two other subjects were considered strictly medical: Chemistry for Medicine and Zoological Medicine.

In 1845, however, the Faculty of Pharmacy was once again separated again from that of Medicine. At that time a first-year-preparatory course was added to the bachelor degree and the doctorate degree reinstated. Inorganic Chemistry was included in the curriculum so that by 1866 the degree program was made up of 16 subjects.

By the year 1927, the preparatory year of studies was common for both the Sciences and Medicine and it included General Physics, General Chemistry, Mineralogy and Botany and General Zoology. The preparatory year was short but intensely oriented toward the field of pharmacy.

After 1934, and for the first time in the university environment, the studies of Bromatology, Microbiology, Biochemistry and Pedology (the study of soils) were added.

In 1944, the number of years necessary for a degree in Pharmacy was increased from four to six. The first year – considered preparatory, formative and selective – was studied in the Faculty of Sciences. At this point the Pharmacy student reached the height of their scientific education. Aspects of professional orientation followed subsequently.

In 1965, however, the degree program was reduced to five years and split into two basic branches of study to be chosen in the fourth or fifth year: one branch was oriented more towards the chemical aspect while the other focused more on the naturalist area.

This adjustment was officially verified by the General Education Law of 1970 and approved in 1973, thus organizing the degree curriculum into five years: one cycle of three years and one cycle of two years. The tendency for students has been to commit to more specific specialisations in the second cycle of studies: Sanitary, Industrial, Biochemical and Environmental Health.

After 1975, different study plans developed for the various universities in Spain. While fundamentally consistent, each university modified the basic subjects to reflect their own areas of specialisation. The branches that were available to major in were and still are: Public Health, Industrial, Biochemical, Environmental Health, Clinical Analysis, Natural Health Products and Practical Pharmacy. None of the universities, however, offered these subjects at the same time. Therefore, the tendency for each university to boast individual specialisations came more forcefully into practice.

The 1973 academic requirements did not modify what had been required in 1965 to a great extent. However, some additional study options were offered to enable the pharmacist to be a well-rounded professional and an expert in all aspects of medicine. This aspect of the curriculum, owing to pluridisciplinary educational preparation, included a total dedication to public health problems.

With an educational background based on courses in Biochemistry, Clinical Analysis, Microbiology and Parasitology, the Pharmacy graduate was highly regarded. Moreover, the Spanish Pharmacy degree holder continued to be vital to the pharmaceutical industry, possessing a scientific understanding necessary for all aspects of environmental health problems.

What has been demonstrated here is that the study of pharmacy in Spain has always had a scientific structure; although this structure has been forced to adapt to the exigencies of the political, social and economic contexts of the particular moment. It has developed throughout the years along with the scientific advancements and social necessities of the times, but has always remained focused on the correct formation of expert pharmaceutical professionals in drug management and all aspects of human health. The areas of Chemistry and Biology have provided a working ground for many outstanding scientists. The Faculties of Pharmacy in Spain have presented and developed numerous areas

of study and research that are highly regarded and of international repute.

The latest educational reform plan, implemented in 1992–1993, has meant not only the scientific modernisation and updating of studies to reflect current social reality, but also complying to the European regulations in this area (Directives 85/432, 85/433, 85/584 and 90/658).

The strictures of both the European Union and the Spanish Ministry of Education and Science now influence the direction of pharmaceutical studies in Spain. Academic requirements have been refashioned in an effort to anticipate the future knowledge requirements that either society or surrounding countries might demand. Building on the previous academic degree requirements (1973), new aspects and study areas have been included, such as Pharmacology, Pharmatherapy, Clinical Pharmacy, Biopharmacy, Pharmacy Management, Toxicology, Anatomy, Immunology, Genetics, Alternative Medicine and Phytology, Clinical Biochemistry, Biotechnology, Human Dietetics, Environmental Protection and Health, Clinical Analysis, Industrial Pharmaceutical Technology, and Supervised Laboratory Practice.

This multidisciplinary subject load attempts to offer a wide range of topics and areas of interest to complement the traditional scientific demands of Pharmacy. These areas of specialisation, contemplated in the Royal Law 2708/82, include: Hospital Pharmacy, Clinical Analysis, Clinical Biochemistry, Microbiology and Parasitology, Drug Analysis and Control, Industrial Pharmacy and Pharmaceutics, Experimental Pharmacology, Industrial Microbiology, Nutrition and Dietetics, Radiopharmacy, Environmental and Public Health, Experimental and Analytic Toxicology, Food Technology, and Hygiene.

As a result of their training, the graduate pharmacist has the opportunity to open up his/her own pharmacy or to enter a wide range of professional fields, both in the public sector (public health, industry, environment, local government, military defense, labour, social security,

etc.), or in the private sector (industrial pharmaceuticals, cosmetics, food and dietetics, etc.). There is also the possibility of entering the academic world of teaching and research.

Since the 1993 academic degree requirements were established, the full-time student of Pharmacy reads for a five year period, which is divided into two cycles. The first cycle is made up of three years and the second of two years. Also, a student has 6 months of full time supervised laboratory practice in pharmacy offices or in hospital pharmacy services.

The total number of academic hours needed to graduate is 3450 which does not include the 6 months of full-time stages. These academic hours are divided into an obligatory group of 2705 hours for compulsory subjects and 745 hours of elective studies.

The free selection of elective studies permits the Pharmacy student to formulate various approaches towards areas of Clinical Analysis, Social Pharmacy, Public Health, Biochemistry, Biotechnology, Pharmaceutical Dietetics, Industrial Pharmacy, Natural Products and Phytotherapy or Environmental Health. This process fosters a prespecialisation that will be useful for the student's future entrance into the professional labor market.

In addition to the bachelor's degree, the Faculty of Pharmacy offers in its third cycle 12 doctoral programmes and several postgraduate degrees issued by the university itself. The opportunity for postgraduate work contributes to the well-rounded education offered to the students and provides him/her with a level of professional specialisation.

What we have explained up to now corresponds with an advanced model of Pharmacy education, based on solid scientific theory and practical experience. The pharmacist graduate can then participate in any area or at any level in the world of Health Sciences where professionals with a strong base in Chemistry and Biology, plus an understanding of drugs and medicaments, are needed.