



## Special Article

# Residency Training of European Respiratory Medicine Specialists: The HERMES Project

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## ABSTRACT

Given the movement of medical specialists across borders in recent years, and the changes in legislation affecting the structure and operation of boards responsible for the various medical specialties, the task of harmonizing the training of respiratory medicine residents across the European Union has become crucial. The project for Harmonised Education in Respiratory Medicine for European Specialists (HERMES) is a collective response to this need. After 3 years of work toward building consensus, HERMES is entering its second phase. The Spanish Society of Pulmonology and Thoracic Surgery (SEPAR) has the aim of informing our resident trainees, their instructors, and others concerned with postgraduate education in respiratory medicine in Spain about this undeniably difficult task of harmonization.

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## La formación especializada en neumología en Europa. El proyecto HERMES

## RESUMEN

El flujo de médicos especialistas al que se está asistiendo recientemente y los cambios en la legislación relativos a la estructura y al funcionamiento de las comisiones de las distintas especialidades médicas reclaman un esfuerzo para armonizar la formación en neumología en todos los países de la Unión Europea. La iniciativa HERMES (Harmonised Education in Respiratory Medicine for European Specialists) responde a esta necesidad y se encuentra ya, tras 3 años de trabajo consensuado, en el final de su segunda fase. El proyecto SEPAR-HERMES pretende aproximar este indudable esfuerzo de homogeneización a los residentes, los tutores y las demás personas interesadas en la formación del posgrado en neumología en España.

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## Introduction

The movement of professionals across borders is a growing phenomenon and Spain is becoming increasingly open to the outside world. The last 10 years have seen larger numbers of health-care professionals from Spain moving to other countries in search of better working conditions, and there has also been an influx into Spain, as we acquire specialists to cover our own health-care needs. Between 2004 and 2006, non-European Union nationals were granted 8228 licenses to practice, a figure that represents nearly 75% of those who left Spain. The number of residency training positions offered here has also risen above the number in most Latin American countries and many European ones.<sup>1</sup> This situation obliges us to reflect on the social and health-care consequences of the cross-border flow of medical specialists we have been experiencing. Can we be sure that arriving physicians, many of whom come from non-European Union countries, have received training that is equivalent to that of our specialists? Do they fulfill the quality standards our legislation requires for Spanish specialists?

Undergraduate medical school education for future doctors generally lasts longer in Spain than in other countries. This appears reasonable, however, as it provides our graduates with skills and degrees that are recognized in each and every one of the countries of the European Union. In fact, Spanish medicine enjoys a very good reputation abroad, especially since the start of the national system to provide medical intern and resident (MIR) training.<sup>2</sup>

In response to the need to harmonize the knowledge of European respiratory medicine specialists, the European Respiratory Society (ERS) launched the project for Harmonised Education in Respiratory Medicine for European Specialists (HERMES) 3 years ago. We explain the project in detail in this paper, summarizing the ongoing development of the Spanish MIR system and focusing on our national syllabus for respiratory medicine. We will describe the development and content of that syllabus and then briefly compare it to the European core syllabus. Finally, we will set out the aims and results of the work of the International Relations Committee of the Spanish Society of Pulmonology and Thoracic Surgery (SEPAR), so that members of the association who are involved in postgraduate education may become familiar with European initiatives.

## The HERMES Project

The ERS launched an educational project in the spring of 2005 with the aim of standardizing academic training and clinical practice in respiratory medicine throughout Europe. HERMES, as the project was called, not only involved cooperation between members of the European Union, but also entailed an exercise in critical assessment, representing a new opportunity to define and organize the core competencies and skills a specialist should have in this field.

Why was HERMES given this name? Hermes is the Greek god of borders and the travelers who cross them. The acronym refers to the aforementioned title of the project: Harmonised Education in Respiratory Medicine for European Specialists. HERMES was conceived with the aim of assuring that a resident who trains in pulmonology in any given European country will not be prevented from acquiring the same competencies and skills that European trainees are acquiring in other countries. The harmonization of training programs must lead inevitably to an increase in the quality of our accredited specialists, making it easier for them to move freely throughout Europe in the various phases of their professional careers.

HERMES is the work of several European organizations. One is the aforementioned ERS. Others are the pneumology section of the European Union of Medical Specialists (UEMS), the Forum of European Respiratory Societies (FERS), the European Board for Accreditation in Pneumology (EBAP), the European Lung Foundation

(ELF), and the Permanent Working Group of European Junior Doctors (PWGEJD). The project has unfolded in several phases. In a preliminary phase, the main respiratory medicine societies in European countries were asked to give their opinions on harmonization, and an international working group was established to define a starting point for the first phase. Phase 1 produced a core syllabus for respiratory medicine, using the Delphi process to reach a consensus among 4 groups of experts: *a*) the leaders of the working group (the HERMES Educational Task Force), *b*) representatives of national educational boards in our specialty and of the ERS School of Respiratory Medicine, *c*) delegates designated by the ERS, and *d*) a representative sample of trainees in respiratory medicine from the different countries involved.

These 4 groups of experts completed a series of online surveys that proposed various subjects for study and asked the respondents to choose which ones they thought should be included. Finally, the leaders of the HERMES Educational Task Force met in Munich in November 2005 to draft a list of items to propose for the training syllabus. This meeting marked the start of the first series of surveys (round 1 in the Delphi process, from December 2005 to February 2006). Round 1 also involved 2 open participatory meetings: one with a panel of experts from each of the national educational boards and the other with a panel of ERS delegates. After processing all suggestions, the HERMES Educational Task Force met a second time in February 2006 in Berlin to discuss points that had come up during evaluation of the draft in order to determine how it might be revised.

A second draft emerged from this meeting and was made available to the 4 sections of the working group (round 2 in the Delphi process, March 2006). In this round the experts were asked to rank the items proposed for the syllabus according to whether each should be considered mandatory, optional, or not relevant. They were also asked to assign each item a number from 1 to 3 to represent the level of competence a resident should have on completing training (Table 1). Around 480 European physicians and residents participated online, and in May 2006 another plenary meeting was held in Munich. As shown in Figure 1, this session was the start of the third and last round in the Delphi process (June 2006). This round culminated in the last meeting of the task force in Amsterdam at the end of June, when the final version of the syllabus was prepared.<sup>3</sup>

Public dissemination of the core syllabus then commenced with posting on the ERS website. Translations into the languages of all the participating countries were also posted.<sup>4</sup> Figure 2 and Table 2 show the structure and content of the final syllabus. Nine modules are each divided into several subjects. Right heart catheterization (skill D.2.21), for example, is optional and classified as requiring level 2 competence, meaning that on completion of residency training it is not mandatory for a European pulmonologist to know how to perform this procedure independently. Knowledge of the procedure is expected, however, and the trained specialist should be able to carry it out under supervision and even know when to refer the patient to another specialist who is competent to perform it. Transbronchial lung biopsy (skill D.2.12), on the other hand, is

**Table 1**  
Definitions Used in the HERMES Project

*Levels of training responsibility*  
Optional subjects: Inclusion in the syllabus is recommended, but not mandatory  
Mandatory subjects: Inclusion in the syllabus is required  
Subjects that are not relevant: These are automatically eliminated

*Levels of competence*  
Level 1: Awareness sufficient to recognize when to refer a patient  
Level 2: Knowledge sufficient to manage a task with supervision (or refer the patient)  
Level 3: Advanced knowledge sufficient for independent specialist practice

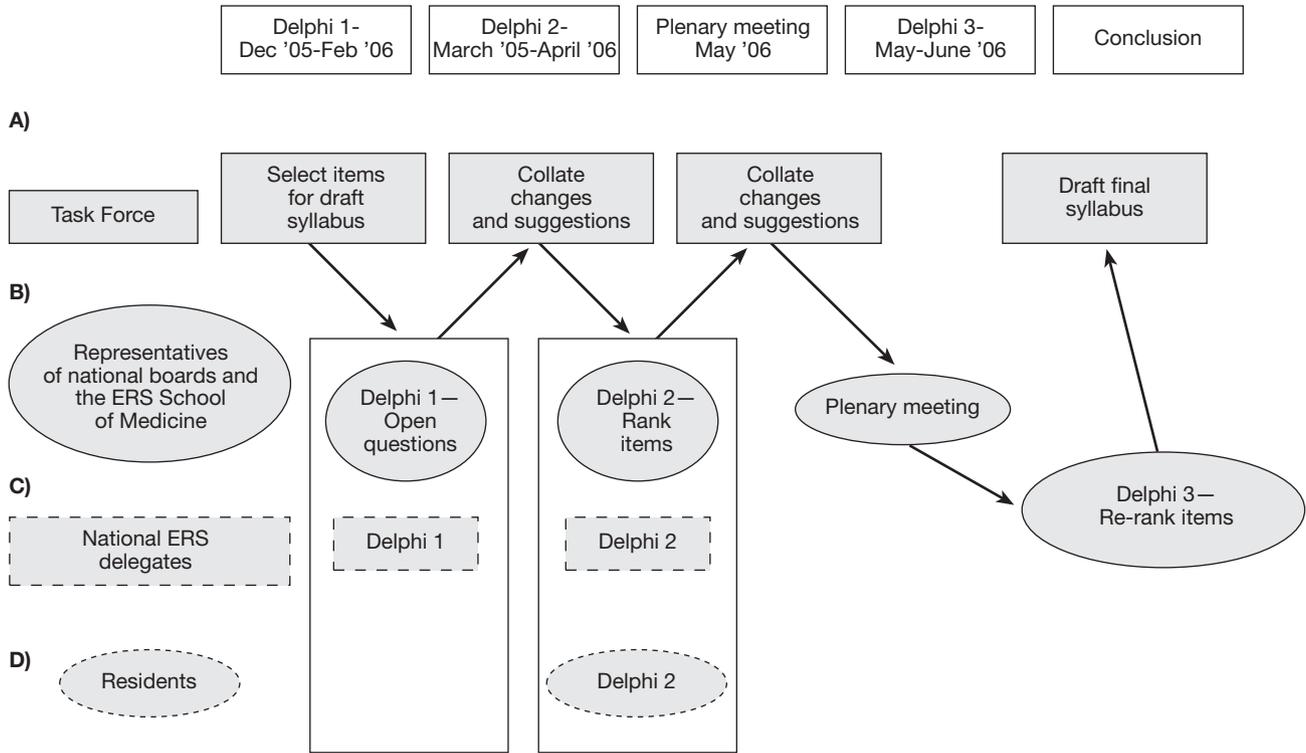


Figure 1. Process of planning and carrying out the HERMES project (based on Loddenkemper et al<sup>3</sup>). ERS indicates the European Respiratory Society.

	Delphi 1	Delphi 2	Delphi 3	Plenary
<b>HERMES European Core Syllabus in Adult Respiratory Medicine</b>				
Level 1: Awareness sufficient to recognise and know when to refer				
Level 2: Knowledge sufficient to manage with supervision (or refer)				
Level 3: Advanced knowledge sufficient for independent specialist practice				
<b>Module A.1: Structure and function of the respiratory system</b>				
A.1.1 anatomy	●	●	●	●
A.1.2 development and aging of respiratory system	●	●	●	●
A.1.3 physiology	●	●	●	●
A.1.4 pathophysiology	●	●	●	●
A.1.5 microbiology	●	●	●	●
A.1.6 genetics	●	●	●	●
A.1.7 pharmacology	●	●	●	●
A.1.8 pathology	●	●	●	●
A.1.9 immunology and defense mechanisms	●	●	●	●
A.1.10 molecular biology	●	●	●	●
A.1.11 biochemistry	●	●	●	●
See also module 1				
<b>Module B.1: Airway diseases</b>				
B.1.1 asthma	●	●	●	●
B.1.2 acute bronchitis	●	●	●	●

Figure 2. The HERMES syllabus as it appears on the website of the European Respiratory Society. HERMES indicates Harmonised Education in Respiratory Medicine.

mandatory and has been given a level 3 classification, meaning that a pulmonologist must be competent to perform the procedure independently as a result of residency training. It is absolutely necessary to understand that the levels of competence stipulated in the syllabus are those considered optimal and necessary for a newly graduated specialist after residency training. The list describes the best situation, the one we are meant to aspire to.

The aim of Phase 2 of the HERMES project was to develop a broad curriculum for European studies in respiratory medicine. This meant the definition of training and assessment methods and approaches, as well as organizational systems for managing the syllabus in the various participating countries. The curriculum has 2 sections. The first consists of the curriculum framework, which establishes approaches to take when training specialists in this field. The framework includes a list of general principles for managing training under the syllabus in addition to information on teaching and learning methods, courses, and assessment. The second section stipulates 34 modules that pertain to our specialty and which largely coincide with those published in 2006. Each module refers to both theoretical knowledge and practical skills, as well as recommendations made in clinical practice guidelines issued by the ERS.

In 2006 and 2007 the HERMES Educational Task Force published materials related to the modules on a preliminary basis. These also went through the Delphi consensus process in order to obtain the critical assessment of the previously listed expert groups. This step meant that questionnaires related to the content of the curriculum were always readily available on the Internet. From a website launched in this second phase (in the second half of 2007) it is possible to download educational materials linked to the modules (the "ERS learning resources" in the association's existing educational resources section). Finally, in order to promote trainee involvement, volunteers were awarded 2 months' free membership in the ERS.

Phase 3 of HERMES foresees a voluntary European examination whose aim will be to standardize and regulate the training of future generations of respiratory medicine specialists. The examination, in English, will contain 90 multiple choice questions based on the syllabus published in 2006; candidates will be given 2 hours and 45 minutes to answer the questions. All registered medical practitioners who have already obtained their national accreditation to practice adult respiratory medicine, and who are members of the ERS, may take the examination after payment of a fee of € 250 before June 30, 2008.<sup>5</sup> An official European diploma in respiratory medicine will be awarded by the ERS School of Respiratory Medicine to candidates who pass the test. It must be remembered that taking the test is entirely voluntary and the diploma awarded has no legal standing. The European examination, which will be given every year, is to be administered for the first time on Saturday, October 4, 2008, during the annual ERS conference.

### Medical Residency Training in Spain

Not too long ago, a physician could obtain a medical specialist degree merely by registering with a college of medical practitioners and remaining registered for 2 years. The status of specialist could also be accredited by a hospital department, whether or not the facility belonged to an officially recognized medical school offering the desired degree. Such certification had to be presented to the corresponding university medical faculty. Given this situation, it was not surprising to find physicians who were at once specialists in pulmonology and psychiatry, for example, or in gynecology and sports medicine, or even those who claimed 3 or more specializations.

However, medical science advanced so quickly during those years that it became more and more difficult for physicians to achieve rigorous understanding of a specific area as it broadened and its knowledge base grew. The division of medical practice into highly

**Table 2**

Content of the Core Syllabus for Harmonised Education in Respiratory Medicine for European Specialists (HERMES)

Module A.1. Structure and function of the respiratory system
Module B.1. Airway diseases
Module B.2. Thoracic tumours
Module B.3. Non-TB respiratory infections
Module B.4. Tuberculosis
Module B.5. Pulmonary vascular diseases
Module B.6. Occupational and environmental diseases
Module B.7. Diffuse parenchymal (interstitial) lung diseases
Module B.8. Iatrogenic diseases
Module B.9. Acute injury
Module B.10. Respiratory failure
Module B.11. Pleural diseases
Module B.12. Diseases of the chest wall and respiratory muscles including the diaphragm
Module B.13. Mediastinal diseases excluding tumours
Module B.14. Pleuro-pulmonary manifestations of systemic/extrapulmonary disorders
Module B.15. Genetic and developmental disorders
Module B.16. Respiratory diseases and pregnancy
Module B.17. Allergic diseases (IgE-mediated)
Module B.18. Eosinophilic diseases
Module B.19. Sleep-related disorders
Module B.20. Immunodeficiency disorders
Module B.21. Orphan lung diseases
Module C. Symptoms and signs
Module D.1. Pulmonary function testing
Module D.2. Other procedures
Module D.3. Procedures performed collaboratively
Module E. Treatment modalities and prevention measures
Module F. Core generic abilities
Module G. Competence in fields shared with other specialties
Module H. Knowledge of associated fields relevant to adult respiratory medicine
Module I. Further areas relevant to respiratory medicine

specialist areas occurred as a result of this inescapable reality.<sup>2</sup> The Spanish Royal Decree of 1978 regulating specialist medical practice introduced the MIR system with 51 recognized fields. These eventually became 44, the number still in effect.<sup>6</sup> A national board for each specialty took charge of developing a residency training program and determining the requirements hospitals would have to satisfy in order to become accredited as postgraduate training providers. The same year also saw the constitution of the National Board of Medical Specialties (CNEM), an organ made up of the presidents of all the specialty boards. From the very beginning, its mission included approving syllabi, reviewing the accreditation of training facilities, standardizing the educational criteria of the various national boards, deciding on the equivalence of medical degrees earned abroad and recognizing them, setting the number of residency training positions to offer each year, and organizing the examination which, once passed, would allow a candidate to choose a residency program.

The 1980s were years of considerable growth. Serious problems also emerged, however, because of large numbers of students enrolled in medical schools, for example, and the consequent job insecurity as the market proved unable to absorb the many doctors graduating every year. An understanding grew that the only way to work as a specialist in the National Health Service was through the MIR examination, a difficult hurdle to overcome in those years. By 1984, in fact, the MIR had become practically the only route to specialty training.

In addition to the entrance examination all candidates must take, the MIR system is based on of a training program that covers the responsibilities residents must take on and the knowledge, skills, and attitudes they must gradually acquire under supervision. Training can only take place in facilities accredited by the national board (formerly the aforementioned CNEM, now the National Board of Health Science Specialties, CNECS) under the Spanish Ministries of Health and Consumer Affairs and of Education and Science.

**Table 3**

Year-by-Year Objectives of the Most Recent Residency Training Syllabus in Respiratory Medicine Issued by the Spanish National Pulmonology Board (CNN)

MIR 1	MIR 2	MIR 3	MIR 4
Medical histories of hospitalized patients: 300 Hospital discharge reports: 300	Interpretation of standard chest radiographs: 800 Interpretation of computed tomography scans of the thorax: 100	Fiberoptic bronchoscopy and related instrumental procedures: 100 Pleural needle biopsy: 15	Spirometry and/or flow-volume curves: 600 Plethysmography: 20
In-hospital duty: at least 4 and no more than 6 per month on the average over the course of a year, never including the morning shift, and attending emergency patients	Medical histories of hospitalized patients: 200 Hospital discharge reports: 200 Thoracic surgery (assisting): 6	Spirometry and/or flow-volume curves: 600 Plethysmography: 20 Gas transfer tests (diffusing capacity): 40	Gas transfer tests (diffusing capacity): 40 Arterial puncture: 60 Nonspecific bronchial challenge testing: 20
	Insertion of pleural tubes (assisting): 15 In-hospital duty: at least 4 and no more than 6 per month on the average over the course of a year, never including the morning shift, and attending emergency patients	Arterial puncture: 60 Nonspecific bronchial challenge testing: 20 Respiratory ergometry: 10 Interpretation of polysomnography and/or cardiorespiratory polygraphy: 50 Attending patients with noninvasive ventilation: 120 Central venous catheterization (assisting): 25 Pulmonary arterial catheterization (assisting): 5 In-hospital duty: at least 4 and no more than 6 per month on the average over the course of a year, never including the morning shift, and attending patients on the internal medicine ward; during the rotation in the intensive care unit, all duty hours will be performed in this unit	Respiratory ergometry: 10 Interpretation of polysomnography and/or cardiorespiratory polygraphy: 50 Fiberoptic bronchoscopy and related procedures: 100 Pleural needle biopsy: 15 Medical histories of hospitalized patients: 200 Hospital discharge reports: 200 Attending outpatient clinics: 500 In-hospital duty: at least 4 and no more than 6 per month on the average over the course of a year, never including the morning shift, and attending patients on the internal medicine ward or on the respiratory medicine ward if there is one; half the duty hours will be in the intensive care unit if possible

Abbreviation: MIR, medical intern and resident.

Twenty-seven groups of residents have graduated as specialists as of 2007 thanks to the MIR system. The number of accredited training facilities offering respiratory medicine went from 36 in 1986 to 65 in 2008. The number of accredited residency positions offered rose from 64 in 1986 to 108 in 2008.<sup>7,8</sup> The current curriculum calls for 4 years of training, even though a syllabus requiring 5 years has been requested repeatedly by the National Pulmonology Board (CNN) in the course of successive revisions (1979, 1984, 1995, and 2005).<sup>7,8</sup>

The respiratory medicine syllabus is developed by the CNN and then approved by the CNECS (formerly the CNEM).<sup>9</sup> The SEPAR website offers the latest version—approved by the CNEM at the end of 2005, though drafted by the CNN at the end of 2002, reflecting how very slowly the health-care administration works.<sup>10</sup> It has still not been officially published by the Ministry of Health and Consumer Affairs, however, though publication is expected in the second quarter of 2008. The new syllabus, which begins by naming and defining the content and competencies of our specialty, has 3 main sections: *a*) general objectives and the specific content of training (knowledge, skills, and attitudes); *b*) mandatory in-hospital and external rotations, and optional ones (including the possibility of external rotations of up to 2 months); and *c*) the specific objectives to be covered and skills to be taught in each of the 4 years of residency training, with skill acquisition classified on 3 levels of competence (Table 3).

An aspect of this new syllabus that should be highlighted is that certain positive attitudes are specified for development. In this way, the syllabus reaches beyond mere acquisition of theoretical knowledge or skills needed for practicing respiratory medicine.

Some examples, among the many that could be given, can be seen in the call for sensitivity to ethical and legal principles in medical practice, concern for the doctor-patient relationship and provision of full and integrated care, the development of a critical attitude toward the effectiveness and cost of diagnostic and therapeutic procedures and the relationship between risks and benefits, collaboration with other specialists and professionals providing health care, and a demonstration of interest in autonomous learning and continuing professional development.<sup>50</sup>

### Comparison of the CNN and HERMES Project Syllabi

After these descriptions of the features of the 2007 HERMES syllabus and the 2002 CNN syllabus, it should be useful to outline how they differ and identify the possible impact of the differences on the training of our respiratory medicine specialists (Table 4).

1. Relationship between theory and practice in respiratory medicine. The CNN program establishes a certain degree of separation between these 2 facets of learning, in line with an approach that has sometimes been evident in undergraduate education up to now. The HERMES syllabus calls for more active learning with scaffolding and a greater "adjuvant" role for theory and practice. It is further suggested that this approach should begin at the undergraduate level. Medical faculties should begin the process of defining the competencies their students must acquire by the time they receive a medical degree in accordance with a specific model. Universities cannot afford to turn a blind eye to the way resident training is carried

**Table 4**  
Observations on Comparing the Respiratory Medicine Residency Training Syllabus of the National Pulmonology Board (CNN) to the Syllabus of the HERMES Project

Syllabus of the National Pulmonology Board	Syllabus of the HERMES Project
Greater distinction between the theory and practice of respiratory medicine	Stronger "adjuvant" effect of associated theory and practice
Greater overlap with other medical specialties	Stronger trend toward multidisciplinary working methods
Quantitative educational objectives that are difficult to assess	Qualitative educational objectives that are easy to assess
Scarce differentiation between mandatory and optional skills	Greater differentiation between mandatory and recommended skills

Abbreviation: HERMES, Harmonised Education in Respiratory Medicine for European Specialists.

out. They must define undergraduate competencies strictly in consonance with postgraduate ones.

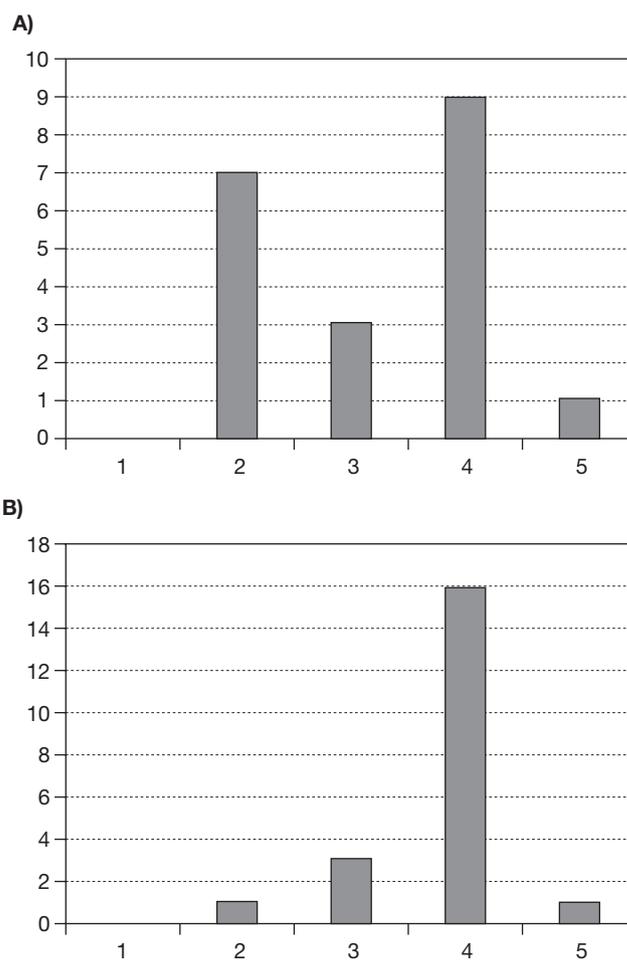
- Relationships of pulmonology to thoracic surgery and to other medical specialties (interventional medicine, multidisciplinary cooperation and working protocols). New diagnostic and therapeutic procedures offer directions for the further development and expansion of our field. We must seize this opportunity to encourage teamwork and improve the quality of medical care. We should also remember that, just as is the case in other specialties, many of the diseases we treat have multidisciplinary implications. The HERMES syllabus scrupulously specifies the level of competence and responsibility of the pulmonologist with regard to invasive bronchoscopic and endoscopic procedures, for example, or heart catheterization, etc. The CNN syllabus gives less guidance on these matters. It is therefore likely that there will be more debate and even conflict between specialties as they claim certain competencies for themselves.
- The inclusion of difficult-to-assess quantitative objectives versus qualitative ones that are easier to assess. The CNN program specifies that the resident should keep a record of the number the medical acts he or she performs in the course of training. In theory, this would be an excellent way to assure technical and procedural training and learning for routine clinical practice. However, it is clear that very few residents count the number of times they actually perform a given procedure. Nor is it easy for the supervisor to do so. Annual evaluations by the supervisor are limited in practice to giving a qualitative assessment of the resident's ability (adequate, outstanding, superior) in each of the established sections of the syllabus. In contrast, the objectives of the HERMES syllabus are qualitative and easier to assess without taking quantity into account. Nonetheless, the HERMES task force is discussing the need to specify the numbers of medical acts a trainee is to perform.
- Ratio of mandatory skills to recommended ones. Unlike the HERMES syllabus, the CNN syllabus does not make a clear distinction between mandatory and optional competencies.

It can be seen that the CNN syllabus is thorough, ambitious, and carefully designed, even though it is perhaps less practical.<sup>10</sup> This is the case because, on the one hand, it is not easy to quantify procedures performed and the count is not usually taken into consideration when evaluating the resident's performance. On the other hand, there are differences between training facilities even though all were accredited at some point,<sup>11</sup> and the training period is still relatively short (4 years). This means that it would probably be wise to make a clearer distinction between mandatory and optional skills, and to specify ones that can be chosen freely by the trainee. Because the HERMES syllabus is much less detailed—neither specifying a duration for training nor breaking down items year-by-year—it does not suffer from the limitations described.

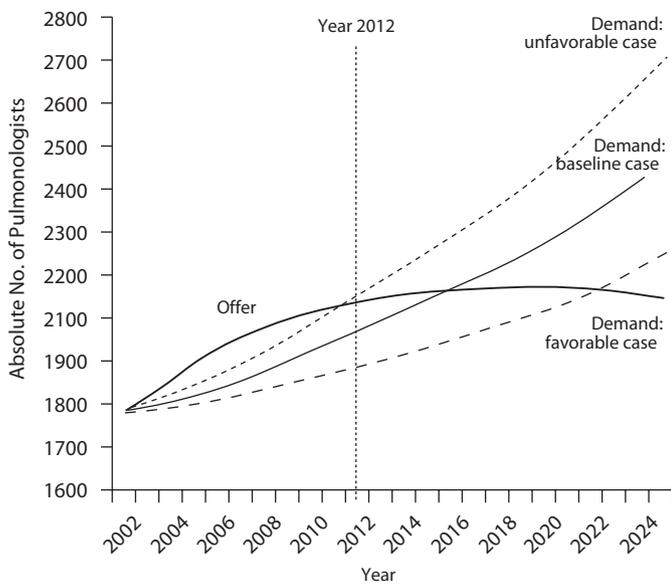
## The SEPAR-HERMES Project

SEPAR launched a project to participate in drafting and help disseminate the HERMES syllabus and curriculum. SEPAR's International Relations Committee has been an active HERMES participant in both facets of the project. As a starting point in the spring of 2006, SEPAR surveyed all fourth-year respiratory medicine residents who were members of the association at that time, asking them to respond to a series of questions about the training they had received. The questionnaire was sent by e-mail and regular mail. Even though participation was not high (only 21 questionnaires were returned, representing a response rate of 61.7%), certain aspects of the trainees' answers (Figure 3) are worth highlighting.

- All reported that they had read their training syllabus and 86% felt it was feasible. However, only 48% felt the syllabus described the training they had actually received. Noteworthy was the opinion of 62% of the respondents that having to pass an annual examination covering theoretical and practical dimensions of the specialty would have improved the quality of their training.
- Significant differences between the training plan at their hospitals (rotations and the availability of material and procedures) and at other centers were noted by 71% of the respondents. Nonetheless,



**Figure 3.** Results of a survey of fourth-year residents in respiratory medicine who were in training from 2003 to 2007. A) distribution (absolute numbers) of responses to the question "Are there training sessions for residents in your service?" (1: daily; 2: weekly; 3: monthly; 4: occasionally; 5: never), and B) distribution (absolute numbers) of responses to the question "What do your rotations involve?" (1: instruction; 2: instruction, and clinical practice to a lesser extent; 3: instruction and clinical practice, in equal proportions; 4: more clinical practice than instruction; 5: only clinical practice).



**Figure 4.** Model predicting the need for specialists in respiratory medicine in the coming years. The absolute number of pulmonologists is plotted against time (years 2003 to 2025). Sensitivity was analyzed by constructing 3 possible scenarios: a baseline situation, a more favorable one, and a more unfavorable one. In the baseline scenario variables were left as they were in 2003, with demand changing only based on demographics. The more favorable scenario would lead to a decrease in demand of 2% over 10 years. The more unfavorable scenario would lead to an increase in demand of 2% over 10 years. Spain had 1800 practicing pulmonologists in 2003. Assuming that number held steady, in the baseline scenario there would continue to be too many pulmonologists until at least 2015; in the more unfavorable scenario (increased demand) the excess number of specialists would last until 2012 and then there would be too few pulmonologists; in the more favorable scenario, more than enough pulmonologists would be available until at least 2025. (Figure adapted from SEPAR.)

Spanish pulmonology training was not considered to be different from that offered in other countries of the European Union in this respect. Thirty-eight percent thought that practical aspects of Spanish residency training were inferior to that received in neighboring countries.

3. Rotations were planned annually in the hospitals of 90% of the respondents, although only 24% reported they had counted the activities they completed.
4. Thirty-eight percent of the respondents reported participating in a line of research being carried out in their hospital, saying that their aim was to start work toward a doctoral thesis.
5. A relatively high percentage (79%) felt the need for a period of common training shared with the residents specializing in internal medicine before starting pulmonology. Eighty-one percent held the opinion that the residency training period should be extended to 5 years.
6. Two-thirds (66%) of the respondents reported that they would once again choose respiratory medicine as their specialty, supposing they were taking the MIR entrance examination again. However, 14% of these said they would choose a different accredited training facility from the one where they were currently working.

## Discussion

Pulmonologists have always felt slightly uneasy about the future of respiratory medicine, possibly because of the limited capacity of the Spanish National Health Service to employ specialists as they emerge from residency programs,<sup>12</sup> giving rise to general dissatisfaction.

Candidates for residency positions in our specialty have had ever lower rankings based on the MIR examination in recent years.<sup>8</sup> This has been attributed to the belief that there are few professional

outlets for them on completion of a residency and also to the idea that they will have scant social and health impact.<sup>8,13</sup> On the last set of MIR assignments made, for example, among the 100 highest-ranked candidates, 69 chose specialties that theoretically have few employment opportunities—yet none of those chose respiratory medicine.<sup>8</sup> What can account for this? Is it possible that young people do not feel the vocation for pulmonology that an older generation felt?

It would be as wrong to think that younger generations feel no interest in this field as to say that there are currently few professional outlets. Quite the contrary—events in recent years predict the coming of substantial change, allowing for a certain degree of optimism. Pulmonology is seeing growth in the development of new diagnostic and therapeutic procedures. This is taking place in the context of the development of new areas of work, such as those related to sleep disorders,<sup>14</sup> noninvasive ventilation,<sup>15</sup> intermediate respiratory intensive care units,<sup>16</sup> smoking cessation therapies,<sup>17</sup> the care of concomitant heart and lung diseases, critical care, home hospitalization, etc. One consequence is that it is extremely important to prolong residency training by a year, an opinion shared by 81% of fourth-year MIR trainees.

Today's pulmonologists must have in-depth knowledge of all the above-mentioned areas. In order to be accredited to provide training, hospitals are required to achieve and demonstrate a scientific level on par with that offered by facilities in countries with well-developed health-care systems. This is the only possible basis for handing over to a new generation of practitioners.<sup>18</sup>

SEPAR's intention to develop a strategic plan for the future of respiratory medicine led to commissioning the services of a firm specialized in health manpower (Advanced Techniques in Health Services Research, TAISS). Their work was completed in 2003<sup>19</sup> with the presentation of a predictive model able to estimate the need for pulmonologists in the short-, medium-, and long-term. Based on diverse variables relevant to the need for pulmonologists in the future and the number of trainees, as well as on the ages of the specialists working today, the model was able to project future needs (Figure 4). The conclusion was that supply and demand for specialists would be balanced in 2005 and this would solve the problem of too many specialists being available before that time. After that year, demand would outstrip supply, a trend which we have perhaps begun to see recently. An exhaustive study carried out in 2007 analyzed the balance of losses and oversupply in various specialties, showing a moderate increase of 0.5% in demand.<sup>20</sup> The only medical specialty with a serious deficit was respiratory medicine.

The arrival of pulmonologists from non-European Union countries will require establishing minimum training standards and also the means for updating knowledge and skills. In this context, the HERMES project can be seen as a genuine opportunity to harmonize educational systems on the basis of both theory and practice. Only then will the free movement of qualified specialists become feasible.

The pulmonologist of the 21st century must be enthusiastic and mobile. All graduating residents might like to stay with the hospital that trained them, or at least stay in the same city or region. However, opportunities might await elsewhere and at this time there is no doubt that specialists should embrace those opportunities. "Elsewhere" might be farther and farther away and, in fact, training in pulmonology includes specific objectives related to the learning of English. To this end, it is essential that training be appropriate and fully standardized, which is to say, its quality must be assured.

Research complements clinical practice. Fortunately, pulmonologists express interest in scientific enquiry not only to enhance their career positioning, but also because they see research as a way to improve professionally. To that end, residents should be introduced to research and helped to acquire the principles on which clinical research and scientific communication are based; this occurs in our Spanish national program.<sup>10,21</sup>

Now, more than ever, if the respiratory medicine specialist feels confident and convinced, he or she has available the tools with which to effect change, even to create clinical practice guidelines adapted to our context, and to feel satisfied that his or her study and work will have an impact on the rest of the scientific community.

### Conflict of Interest

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### References

- Asociación Española de Médicos Internos Residentes (AEMIR). Website [cited 27/03/2008]. Available from: <http://aemir.org/mirextranjeros.htm>
- Viejo Bañuelos JL. Influencia del sistema MIR en la formación del neumólogo actual. Arch Bronconeumol. 1991;6:245-6.
- Loddenkemper R, Séverin T, Eiselé JL, Chuchalin A, Donner CF, di Maria GD, et al. HERMES: a European core "syllabus" in respiratory medicine. Breathe. 2006;3:59-69.
- European Respiratory Society. HERMES European syllabus dissemination [cited 27/03/2008]. Available from: <http://hermes.ersnet.org/452-syllabus-dissemination.htm>
- Loddenkemper R, Haslam PL. Multiple choice and the only answer: the HERMES examination. Breathe. 2008;4:243-6.
- Real Decreto 183/2008, de 8 de febrero, por el que se determinan y clasifican las especialidades en ciencias de la salud y se desarrollan determinados aspectos del sistema de formación sanitaria especializada. BOE. 2008;45:10020-35.
- Álvarez-Sala Walther JL, Sánchez Gascón F, Bravo Bravo JL. Las comisiones nacionales de especialidad. In: Álvarez-Sala Walther JL, Casan Clarà P, Villena Garrido V, editors. Historia de la neumología y la cirugía torácica españolas. Madrid: Ramírez de Arellano Editores SL; 2006. p. 327-40.
- Villena V, Álvarez-Sala JL. Horizontes en la neumología española: algunas reflexiones. Arch Bronconeumol. 2007;43:573-84.
- Álvarez-Sala Walther JL, Sánchez Gascón F, Pozo Rodríguez F, Viejo Bañuelos JL, Vereza Hernando H, Pérez Martí M, et al. Neumología. In: Guía de formación de especialistas. 3rd ed. Madrid: Consejo Nacional de Especialidades Médicas de los Ministerios de Sanidad y Consumo y de Educación y Ciencia; 1996. p. 405-11.
- Comisión Nacional de Neumología. Programa de formación en neumología. Website of the Sociedad Española de Neumología y Cirugía Torácica (SEPAR) [cited 27/03/2008]. Available from: [http://www.separ.es/separ-mir/programa\\_formacion/neumologia.html](http://www.separ.es/separ-mir/programa_formacion/neumologia.html)
- Álvarez-Sala JL, Sánchez Gascón F, Agustí A, Díaz Cambriles MT, Gómez de Terreros FJ, Lozano L, et al. Requisitos para la acreditación de unidades docentes en la especialidad de neumología. Arch Bronconeumol. 2003;39:42-4.
- Rosell A, Miravittles M, Roger N, Jolis R, Llunell A, Morell F. Los residentes de neumología formados en Cataluña (1989-1993). Med Clin (Barc). 1996;106:653-5.
- Torres A. La SEPAR del siglo XXI. In: Álvarez-Sala Walther JL, Casan Clarà P, Villena Garrido V, editors. Historia de la neumología y la cirugía torácica españolas. Madrid: Ramírez de Arellano Editores SL; 2006. p. 447-84.
- Durán Cantolla J, Puertas Cuesta FJ, Pin Arboledas G, María Cano JS. Consenso nacional sobre el síndrome de apneas-hipopneas del sueño (SAHS). Arch Bronconeumol. 2005;41 Suppl 4:5-110.
- Díaz Lobato S, Mayoral Alises S. Reflexiones para la organización y desarrollo de una unidad de ventilación mecánica no invasiva y domiciliaria. Arch Bronconeumol. 2005;41:579-83.
- Torres A, Ferrer M, Blanquer JB, Calle M, Casolívé V, Echave JM, et al. Unidades de cuidados respiratorios intermedios. Definición y características. Arch Bronconeumol. 2005;41:505-12.
- de Granda JI, Carrión F, Alonso S, Márquez FL, Riesco JA, Sampablo I, et al. Atención y prestación de servicios en materia de tabaquismo. Arch Bronconeumol. 2006;42:600-4.
- Miravittles M, Rodríguez de Castro F, Agustí A, Álvarez-Sala JL. Neumólogos: ¿adónde vamos, de dónde venimos? Arch Bronconeumol. 2002;38:334-5.
- Sociedad Española de Neumología y Cirugía Torácica (SEPAR). El informe TAISS. Barcelona: SEPAR; 2005.
- González López-Valcárcel B, Barber Pérez P. Oferta y necesidad de médicos especialistas en España (2006-2030). Madrid: Ministerio de Sanidad y Consumo; 2008 [cited 27/03/2008]. Available from: <http://www.msc.es>
- Rodenstein D. ¿Qué debemos aprender los neumólogos en los próximos años? Arch Bronconeumol. 2002;38:189-90.