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EDUCATION

Training of specialists in Orthopedic Surgery in Europe

Formación de especialistas en Cirugía Ortopédica en Europa

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Introduction

This first limitation of the analysis is geographic. The question of where Europe starts and finishes is in full debate. The European Union has 27 members, but obviously this leaves out nations such as Switzerland and Norway, which are indisputably part of Europe. At the same time, and because of some very broad application of political criteria, we sometimes include some old Republics from the old Soviet Union, which are geographically a long way away and about to become Islamic Republics. This analysis has been limited to the orthopaedic section of the Union of European Medical Societies (UEMS) so as to avoid any ambiguity. The majority of European countries are represented, although some (Poland, for example) have still not sent representatives from their national society.

The second limitation comes from how to obtain information. The orthopaedic section of UEMS is a committee formed by two representatives from each national society; it holds meetings twice a year and information theoretically constantly flows amongst its members (normally via e-mail). However, to get specific information such as what we are looking for here from each represented nation or society is a very difficult, slow, sclerotic process that comes up against great linguistic pitfalls and bureaucratic red-tape. Theoretically, the information provided is validated by the section and dated May 2010, but I am sure that some of the statements are inaccurate or out of date.

Cyprus and Luxembourg have no University or hospitals to train specialists (it seems that Luxembourg wants to start or is starting training residents), which is why their specialists are usually doctors trained in other European countries. Traditionally, those from Luxembourg have trained in France and Germany and those from Cyprus in the United Kingdom.

Training of specialists, like many other things in Europe, is a veritable Tower of Babel. Totally different. Not even the most imaginative person could develop systems and programs as different, colourful and varied, although when we analyse them carefully, there have many common factors and the variations are more formal than substantial. In fact, the next step that the UEMS has proposed is to set up homogenisation processes for the different schemes. This proposal was presented at the EFORT Congress in Madrid, hosted during the first week of June 2010. However, UEMS only makes suggestions, the political bodies in Brussels and in each State are the ones that decide on the procedure to be applied in their territory.

We have developed an analytical scheme for the different aspects of specialist training to try and analyse the similarities and differences and to try and look for those previously-mentioned homogenisation processes. This scheme is used to focus this report on the following aspects: applicant selection, training supervision for specialists, *curriculum* for training in Orthopaedic Surgery and Traumatology, head of the teaching department and tutor for the doctors being trained.

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Applicant selection

The number of medical graduates that start specialist training every year should be established. In many States this figure is unknown because it is not a single procedure controlled by State run institutions, as occurs in Spain. Likewise, these figures can vary enormously from year to year. The current list is as follows:

– Belgium: 28
- Croatia: 45
- Czech Republic: 40
- Denmark: 34
- Finland: 20
- Greece: 80
- Norway: 21
- Portugal: 45
- Spain: 175

In the majority of countries and years, the number of applicants wanting to be trained in Orthopaedic Surgery is greater that the number of training positions available. However, there have recently been places, such as Denmark, where the system was null some years as there were no applicants. Among the many candidates, how do we choose the applicants and how do we allow them to start training in our speciality? This is the first great parameter throughout the length and breadth of Europe. In many countries, this is carried out through an exam, an exam that is normally developed on a national or regional level, such as in Croatia, the Czech Republic, Denmark, France, Holland, Portugal, Romania, Spain and Turkey. An entrance exam also has to be taken in Italy, but this is on a local level organised by each hospital. In many States, applicants are selected by a personal interview; good examples of this are Austria, Belgium, Finland, Germany and Norway.

Supervision for training of specialists

The system for training of specialists is subject to different controls, as required by Belgium. This supervision is obligated to establish mutual recognition of titles and the free circulation of specialists. Yet, the supervision systems for training are also very varied in the different States. In some countries the body responsible for supervision training of specialist is the Administration. This is the case in many European hospitals, such as those in Austria, Belgium, the Czech Republic, Denmark, Greece, Portugal, Romania, Sweden and Turkey. Which Administration is in charge of this task? It depends on the current State model, as we find examples of State Administration, regional administration, etc. But in other places the task of supervising specialist training has been given to Universities; good examples are Finland, France and Italy. Finally, in a large part of Europe, the supervision of training of specialists has been given to scientific (or professional) societies and/or associations: this is the case in Croatia, Germany, Ireland, Holland, Norway, Switzerland and the United Kingdom.

The previous paragraph has analysed the general supervision of the training system, that is, its schemes and general requirements and its design (about which we will go into more detail later). Still, as well as examining this general supervision, we should lower the analysis level to compare who controls and supervises staff doctors who are in charge of training the specialists. We also find great differences here. In Belgium and Romania, the bureaucratic administration is also in charge of this task, while in many countries this task has been passed to a scientific and/or professional Society or Organisation, as is the case in Denmark, Holland, Ireland, Holland, Norway, Sweden and the United Kingdom. In some other States this routine day-to-day task has been given to the Head of Service/ Department, a scheme applied to Croatia, the Czech Republic, Greece, Spain and Turkey. Finally, Italy designates that the University controls this as well.

Universally, not all health centres or hospitals can train specialist doctors. The services or departments should be accredited by the relevant authority (the authority analysed in this section's first paragraph). The time limit for this accreditation (or authorisation to train specialists) can be unlimited (once achieved, it is "forever", unless there is a specific bureaucratic procedure against it), as in the case of France. Yet the majority of States give accreditations for only limited periods, and they compliment it with periodic audits in many cases. This is the general scheme applied in Belgium, the Czech Republic, Finland, Germany, Ireland, Holland, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

So that the training of specialists can be accredited to a health centre, certain levels of clinical, surgical and/or educational activity are sought in the majority of countries, such as in Belgium, Finland, Germany, Italy, Ireland, Holland, Norway, Portugal, Spain, Switzerland and the United Kingdom. In addition, as part of the supervision process for training, personal interviews are held with the doctors being trained and/or the training doctors in Ireland, Holland, Sweden, Switzerland and the United Kingdom.

Training *curriculum* in Orthopaedic Surgery and Traumatology (OST)

The controlling body has established a *curriculum* in the majority of countries to guide and supervise specialist training, although this *curriculum* also presents great variations in its different characteristics. The objective of this section is to analyse these characteristics in detail.

The time for a specialist's training period varies greatly from one region to another. An example of this is the following list of the number of years required:

3.6: Austria
4.5: Croatia
5: Denmark and Spain
6: Belgium, Finland, Germany, Portugal, Romania and Switzerland
6.5: Norway
8: Ireland

Variable (from 5 to 8): the Czech Republic, the United Kingdom and Sweden

Some countries require the future orthopaedic surgeon to undertake a number and/or type of operations to be performed as an assistant and as a supervised surgeon, together with a certain time for the training period. This idea is encompassed in the concept "list of operations" and is obligatory in Austria, Croatia, Denmark, Germany, Greece, Romania and Switzerland.

In many other countries the training required (that is, the obligatory *curriculum*) includes not only a "list of operations," it covers a complete "programme" or contents, which covers diagnosis training, conservative treatments and attitudes, with a much wider concept of the speciality, etc. This will be explained in detail below. The list of States with a defined programme or contents for training includes: Croatia, Denmark, France, Germany, Ireland, Italy, Holland, Norway, Portugal, Romania, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

However, the *curriculum* is not only normalised and standardised on a state or regional level, but is Law in Spain and Portugal. In some other States, the normalised *curriculum* is only local, that is, each hospital has its own (as is the case in Ireland, Italy, Turkey and the United Kingdom). Finally, there are countries that require a *curriculum*, but on an individual basis; that is, specialists training in the same service have different *curricula*. This is what happens in Ireland, Norway, Sweden, Turkey and the United Kingdom.

In charge of the Teaching Unit, tutor

In this section we analyse who is responsible for day-to-day training, internally for each service.

The head or person in charge for each Teaching Unit is a position carried out by different people in each country. In the case of Austria, the Czech Republic, Finland, Germany, Greece, Holland, Norway, Portugal, Spain, Sweden and Turkey, the head of the Teaching Unit in each department is the Head of Department. In Denmark and Sweden, it is a staff doctor different from the Head of Department who is responsible for training specialists. The responsibility for the Teaching Unit sometimes falls on the Head or Regional Director for training of specialists, as is the case in Belgium, Ireland, Romania and the United Kingdom.

The tutor should be even closer still to the specialists in training. This is a figure that exists in many countries. In Spain and Turkey, it is a position carried out by a staff doctor different from the Head of Department, while in Switzerland it is taken up by the Head or person in charge of the Teaching Unit. In some States the work of tutoring is undertaken by the Head of Service or Department, as is the case in Belgium, Croatia, the Czech Republic, Germany and Holland.

The number of tutors also varies. In many schemes, it is only one person. The Spanish system establishes that there should be a tutor doctor for a maximum of 5 residents, while in Romania, each trainee specialist should have his or her own tutor. Lastly, in Italy, each specialist in training has three tutors with different duties: personal, group and super-specialisation.

Rotation

Specialisation schemes in OST include different rotations according to each country. The final aim is surely the same and the idea is basically adapting to the variations existing among the different national health systems.

First, we will describe the compulsory or recommended rotations by Services or Departments outside Orthopaedic Surgery. The scheme is meticulous and complex. The historically most classic type of rotation is General Surgery (with its different area and extension according to countries, which is becoming ever more specialised). This must be carried out by specialists in training in Austria, Belgium, Croatia, the Czech Republic, Finland, France, Germany, Ireland, Norway, Portugal, Romania, Switzerland and Turkey. Anaesthesiology and Resuscitation rotation is less popular, practised in Croatia, the Czech Republic, Norway, Spain, Sweden, Switzerland and Turkey. Only Croatia does a rotation in Radiology.

Among surgical specialities that have rotation, we must point out that of Vascular Surgery, undertaken in the Czech Republic, Norway, Portugal, Romania and Spain. Another example is Plastic Surgery, which speciaists in training also undertake in the Czech Republic, Norway, Portugal, Romania, Spain and Sweden. In Romania, they also rotate through Thoracic Surgery.

There are also some compulsory rotations in some medical specialities bordering on our speciality. This is the case of passing through Neurology and/or Neurosurgery, undertaken in Austria, the Czech Republic, Norway, Portugal, Romania and Sweden. Similarly, it is compulsory in some states to rotate through Rheumatology (Croatia, the Czech Republic, Norway and Turkey).

As well as the aforementioned rotations outside our specialisation, in many specialisation systems, it is compulsory to rotate or work for a certain period of time in some super-specialised Orthopaedic Units. The purpose is obviously to complete general orthopaedic training in fields that are not so common in the usual working pattern. Consequently, our attention is drawn by the compulsory rotation in Traumatology Units, due to the differences in the health systems, in Croatia, the Czech Republic, Finland, Ireland, Switzerland and Turkey. On the contrary -and many of us advocate this- rotation is only compulsory in Children's Orthopaedics or Paediatrics in Greece, Ireland, Portugal, Spain, Sweden, Turkey and the United Kingdom. Spain and Turkey are the only ones that require time in a spine Unit, just as rotating through a Hand Surgery Unit is only compulsory in Greece and Turkey. Specific training in sports Orthopaedics and/or Arthroscopy is considered compulsory or highly recommended in Greece and Spain, and in Orthopaedic Oncology in Spain and Turkey.

Clinical activity

The training programme applied in many States quantifies and obliges a certain amount of surgical activity to finally achieve the title of specialist. What varies from one country to another is how this quantification is established: it is only the type of operations in some places such as Spain, Sweden,

but in the majority, not only is it the number but also the type, as is the case in Austria, the Czech Republic, Denmark, Ireland, Norway, Portugal, Romania, Switzerland and the United Kingdom. Ireland and the United Kingdom require a certain number of hours in the operating theatre per week.

Out-patient activity is also compulsory in the training schemes in Orthopaedic Surgery in Greece, Ireland, Norway, Portugal, Romania, Turkey and the United Kingdom. These States require a certain number of hours per week.

Finally, we must highlight that only in some countries is a certain level of activity required in Accident and Emergency. This level can be either quantified in the number of hours per week or month, as is the case of Greece, Portugal and Spain, or made up from the number of months worked in Accident and Emergency, such as in Croatia, the Czech Republic, Denmark and Norway.

Training in theory

Many States require a certain level of training in theory. There are two ways of doing this, theoretical teaching in the Department itself and attending specialist courses outside the Department.

The first way, theoretical teaching in the Department that the trainee specialist belongs to, is compulsory with a certain number of hours per month required, a regulation established in many countries (Belgium, Croatia, the Czech Republic, Denmark, Finland, Greece, Italy, Ireland, Norway, Romania, Switzerland, Turkey and the United Kingdom). In others, a certain number of hours per month is simply recommended, but not compulsory, as is the case in Austria, Spain and Sweden.

Attending special courses outside the Department, organised by Scientific Societies or Universities or the Administration is required and compulsory in many countries: Austria, Belgium, Croatia, the Czech Republic, Denmark, Finland, Ireland, Holland, Norway and Switzerland. These courses are recommended but not compulsory in Germany, Greece, Romania, Spain and Sweden. It is also interesting that in some training schemes, the surgeons must not only attend these courses but also sit an exam after each special course: Croatia, the Czech Republic, Holland, Norway and Romania.

Research

Although some people may think that a specialist-in-training's task should just be attending patients, devoting some time to research is also seen as a part of the curriculum. It could not be any other way, because training in research, especially clinical research, is essential for the future specialist, at least in two ways: critical review of literature and results analysis of the case studies themselves. All these considerations have meant that research is compulsory in Denmark, Ireland and the United Kingdom and recommended in Austria, Belgium, the Czech Republic, Finland, Greece, Norway, Romania, Spain and Turkey. Some countries go further, and to complete their training as a specialist, surgeons must present a paper of their choice at congresses of certain renown and/or publish at least one original work: this is the case in Belgium, the Czech Republic, Switzerland and the United Kingdom.

Book by the physician-in-training

This is one of the most extended features in the different training schemes for specialists: the future orthopaedic surgeons should write a book (in many places known by the English name "*logbook*") in which all their training activities over the years are recorded. This practice is so extended and frequent that the training book is compulsory in Austria, Belgium, Croatia, the Czech Republic, Denmark, Finland, Germany, Greece, Ireland, Italy, Holland, Norway, Portugal, Romania, Spain, Sweden, Turkey and the United Kingdom.

In the United Kingdom, a very attractive variant has recently come into use -the "book" or electronic record (called *"e-logbook"*, or *"electronic logbook"*)- (although it has not been applied 100%). All residents go into their personal electronic record on the internet using a secret password and note down daily all their training activities in detail. Staff doctors in charge (for example, those who have taken part in a surgical case with the residents) also access the records with their own code and confirm the veracity of the data and notes.

Only in some countries (among which we find Italy, Norway, Spain and the United Kingdom) does the compulsory nature of the specialist-in-training's book extend to the fact that it should be more or less detailed (and the level of detail is what varies from one place to another). These books can include lists of operations, clinical activities, courses undertaken, research activities, conservative treatment techniques, etc.

On the other hand, it is interesting to see that there is little supervision of the specialist-in-training's book in most places. At least according to the survey carried out by the UEMS Orthopaedic Department, book supervision is compulsory on a yearly basis in Belgium, Italy, Spain and the United Kingdom. Holland adds itself to this group, although the control is compulsory only at the end of training.

Interim assessments

Interim assessments during training are possibly one of the aspects with most differences among States. In contrast to the previous section, where the great coincidence as to the obligatory nature of the specialist-in-training's book was explained, the variations detected here are very great. Furthermore, many countries are changing their schemes, especially when referring to interim and final assessments.

In some places, interim assessments are carried out using the most traditional procedure, the exam. These exams are annual in Belgium, the Czech Republic, Ireland, Italy, Holland, Portugal and the United Kingdom. Obviously, the interim scores the trainee doctor in these countries obtains are based on these exams. In other places, exams take place only at the end of each training stage (that is, they

are not taken annually in a compulsory way): Croatia, the Czech Republic, France, Romania and Turkey.

The types of exam also vary a lot from place to place. In Belgium, Holland, Ireland and Italy, it is based on short questions with a multiple response ("test" type, or with its English initials, "MCQ, *multiple choice questions*"). Other countries prefer to apply practical type exams, based on clinical cases, such as in Ireland, Italy and the United Kingdom.

According to some training schemes for specialists, the interim scores are not based on an exam, but according to continuous assessment criteria (training assessment); such is the case in Denmark, Spain and Sweden. Those in charge of these interim assessments are the Head of the Teaching Unit and/or tutor in Norway and Spain. In other places, the interim scores are obtained by fulfilling the previous assessment protocols (combined or not with the exam scores), such as in Ireland, Switzerland and the United Kingdom.

Final assessment

The variability and differences in this section are also great. This is more shocking when you take into account that the final assessed product (that is, the already-trained specialist) will have the title recognised throughout the European Union and will have the freedom to work all over the continent.

Starting with the most basic aspect -the final exam- we understand that it exists. However, it is voluntary in Spain (where, as we all know, it was just started a few years ago and only a fifth of those enrolled sit it for the time being) and in Sweden (where this voluntary exam is sat by approximately 20% of doctors on finishing their training as specialists). On the contrary, and possibly this is one of the points with greatest coincidence, the final exam is compulsory in many states: Austria, Belgium, Croatia, the Czech Republic, Finland, France, Greece, Ireland, Italy, Holland, Portugal, Romania, Switzerland, Turkey and the United Kingdom.

What is this final exam like? Here we can find all imaginable options. In Austria and Switzerland, it is a multiple choice (a "test"). In Austria, Croatia, France, Greece, Romania and Turkey, it is a conventional oral exam, while it is a written exam in Greece, Romania and Switzerland (in some countries such as Austria, Romania and Switzerland, the exam is set in several parts with different formats). Adding even more variables, the exam is based exclusively on clinical cases in Belgium, Croatia, Ireland, Romania, Switzerland, Turkey and the United Kingdom. Finally, there is no exam as such in Germany and Italy, but a personal interview with the physicians who have just finished their training.

The source or origin of the final qualification given to each already-trained specialist is also very variable. There are many countries that apply the final exam score as the final grade; this is the case in Austria, the Czech Republic, Finland, Ireland, Italy, Romania, Switzerland, Turkey and the United Kingdom. The qualification, or part of it, is based on the specialist-in-training's book in other States such as Italy, Norway, Spain and Switzerland. Finally, the final grade is sometimes based on continuous assessment (or training assessment), a procedure applied in Denmark, Italy, Spain, Sweden and Turkey.

There is only one more aspect to consider in this long comparative list. What do you do with the applicant, a doctor with specialisation who is theoretically complete, if she or he is not capable of passing the final assessment (whether this is Exam, training, etc.)? Again we find differences, but basically two options are considered. The first is that they have to re-sit the examination after a certain time has elapsed; this is the system applied in Austria, Croatia, the Czech Republic, Finland, Germany, Greece, Ireland, Romania and Turkey. The second option is to make the future specialist repeat part of the training period, which is the procedure that is the norm in Belgium, Denmark, Greece, Italy, Norway, Portugal and Spain.