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## Intensive care training and speciality status in Europe: international comparisons

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**Abstract Objective:** To describe current arrangements for postgraduate training and speciality status for intensive care medicine in Europe, and to compare these with three other geographical regions: the Middle East, North America, and Australia and New Zealand.

**Methods:** An iterative survey, by questionnaire and direct discussion, of council members of the European Society of Intensive Care Medicine, national specialist societies with involvement in intensive care, and national experts, representing four geographical regions and 47 countries.

**Results:** For the purposes of analysis, countries with common training structures have been grouped together; the denominator therefore includes both countries and regions. Formal training programmes in intensive care medicine (ICM) are available in 18 (85%) of the 21 countries or regions surveyed. Twelve (57%) offer multidisciplinary access to intensive care training with a common core curriculum. In six (28%) training in ICM is available solely through anaesthesia. The duration of intensive care training required for recognition as a spe-

cialist in the 18 countries or regions with a formal programme ranges from 18 to 30 months, with a median of 24 months. All countries assess competence in intensive care, but methods for doing so vary widely. Eighteen countries or regions offer specialist registration (accreditation) in ICM; in 12 this is provided as dual accreditation in a base speciality and in ICM.

**Conclusions:** There is substantial support for multidisciplinary training in ICM, as demonstrated by collaborative interspeciality developments in many countries. We propose that these national developments should be strengthened within Europe by the recognition of 'supra-speciality' status for ICM by the European Commission, and by the establishment of a multidisciplinary Board for training in ICM, with international agreement on core competencies and duration of training programmes, and a common approach to the assessment of competence through formal examination.

**Key words** Intensive Care · Critical care · Training · Education · Specialisation · Medical training

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### Introduction

Intensive care medicine is a relatively young discipline which dates its origins from the response to the polio ep-

idemic in Copenhagen in 1952 [1]. Since then, anaesthesia and respiratory medicine have generally been the disciplines most closely linked to intensive care practice. While these disciplines have contributed very substan-

tially to intensive care practice and research, the association has not facilitated access to intensive care for other specialities. Perhaps in consequence, this has tended to produce a fragmented subspeciality approach to the challenges faced by this high-technology, high cost activity. In recent years many intensive care clinicians have come to favour a collaborative, multidisciplinary approach to training and practice. There is also increasing recognition by trainees generally of the value of experience gained in intensive care. It was the purpose of this survey to examine differences and similarities in training and speciality status between various countries, in order to explore the possibilities of producing common structures.

A questionnaire survey [2] of European Region countries published in 1996 examined predominantly undergraduate and some postgraduate aspects of training in intensive care. The survey achieved a 47% response rate and was not iterative, but it found considerable international variability and called for 'speciality or sub-speciality' and academic recognition of intensive care. In the same year the European Society of Intensive Care Medicine (ESICM) published the recommendations of a working party for the content and duration of training programmes in intensive care medicine [3]. We now report the results of an iterative enquiry into current structures for adult intensive care training, including speciality status in the countries of the European Community and region, and have compared these with the Middle East, North America, and Australia and New Zealand.

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## Methods

Questionnaires were sent to members of Council of the ESICM, to national societies of intensive care, and to other intensive care practitioners, seeking information about national structures for speciality status and training in adult intensive care medicine. Initial responses were then subject to further revisions by post, telephone, and direct discussion. Two open presentations were made in Council and in two collaborative meetings with representatives of national societies representing intensive care, in order to ensure uniformity of response. It became evident during this process that language and terminology could make a substantial difference to the information obtained, and every effort has therefore been made to resolve inconsistencies.

In this article, the structure of intensive care training and accreditation has been described in the following terms: as a complete primary *speciality* with entry directly following primary medical qualification; as a *sub-speciality* of another discipline (e.g. anaesthesia, respiratory medicine); and as a multidisciplinary *supra-speciality* with a common core curriculum accessible to trainees from a range of base specialities.

It was not the intention of this survey to obtain comprehensive world-wide information, but to compare the situation within Europe and the countries represented by the ESICM, with other countries and regions which would adequately reflect the diversity of possible models. To facilitate analysis, countries which share

training programmes or which have common educational and training structures have been grouped together; these are the five Nordic countries (Denmark, Finland, Iceland, Norway and Sweden), the 22 Arab Region states, and Australia and New Zealand. Analysis is based on a denominator of 21 countries or regional groupings.

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## Results

Complete responses were obtained from all participants representing 47 countries. Data from the countries of the Nordic and Arab Regions, and Australia and New Zealand, have been combined in these groupings (Table 1).

### Organisations with responsibility for postgraduate medical education and speciality status

Most countries employ a tripartite system for determining standards of medical education and practice, with responsibility shared between government ministries, universities, and professional medical organisations (specialist colleges and societies). However, the precise role and authority of each group varies substantially. In some countries professional regulation is predominantly the responsibility of medical organisations; in some, the power rests with individual universities; and in others, with government ministries of education or health. These differences influence the ease with which nascent specialist groups such as intensive care manage to gain an independent voice at national level. This is important, because the European Commission will not recognise training programmes (and hence accord speciality status) unless the training programmes are recognised in a number of member states [4]. Thus speciality status is determined at national level and is dependent to a large extent on national politics.

### Undergraduate teaching in ICM

Exposure to ICM is available to medical students in most countries. Responsibility for teaching tends to follow the postgraduate structures for ICM; for example, it is provided during anaesthetic and surgical teaching in some countries where ICM is predominantly anaesthetic-lead. Although it forms an identifiable part of the curriculum (in at least some of the universities) in most of the countries surveyed, there is no common core knowledge or duration of teaching. There is evidently scope for international co-ordination of standards for undergraduate teaching in ICM as part of the spectrum of emergency care, resuscitation and ethics.

**Table 1** Summary of data obtained from ESICM survey of training and accreditation in intensive care medicine

| Q* | Austria | German | France | Belg | Italy | Spain | Portugal | Greece  | Turkey | Sloven | Czech |
|----|---------|--------|--------|------|-------|-------|----------|---------|--------|--------|-------|
| 1  | Y       | Y      | Y      | Y    | Y     | Y     | Y        | Y       | N      | Y      | N     |
| 2  | Y       | N      | Y      | Y    | N     | N     | Y        | Y       | N      | N      | N     |
| 3  | -       | Y      | Y      | -    | Y     | -     | -        | -       | Y      | Y      | Y     |
| 4  | -       | M      | A+I    | -    | A     | -     | -        | -       | A      | A      | A     |
| 5  | N       | N      | N      | N    | N     | Y     | N        | N       | N      | N      | N     |
| 6  | 30      | 24     | 24     | 24   | 18    | 60    | 18       | 24      | -      | 12     | -     |
| 7  | O, C    | O      | O, D   | O, M | O, D  | S     | O, C     | D, O, C | -      | O, C   | P     |
| 8  | Y       | N      | Y      | Y    | N     | N     | Y        | Y       | -      | N      | -     |
| 9  | M       | -      | M      | M    | -     | -     | M        | M       | -      | -      | -     |
| 10 | Y       | Y      | Y      | Y    | N     | Y     | Y        | Y       | N      | N      | N     |
| 11 | D       | B      | D, B   | D    | B     | S     | D        | D       | N      | B      | N     |

  

| Q* | Ireland | UK   | Nether | Nordic | Switz | Israel  | Arab R | USA   | Canada | A&NZ | TOT |
|----|---------|------|--------|--------|-------|---------|--------|-------|--------|------|-----|
| 1  | Y       | Y    | Y      | Y      | Y     | Y       | N      | Y     | Y      | Y    | 18  |
| 2  | Y       | Y    | Y      | N      | Y     | Y       | N      | N     | Y      | Y    | 12  |
| 3  | -       | -    | -      | Y      | -     | -       | Y      | N     | -      | -    | 8   |
| 4  | -       | -    | -      | A      | -     | -       | A      | M     | -      | -    |     |
| 5  | N       | N    | N      | N      | N     | N       | N      | N     | N      | N    | 1   |
| 6  | 24      | 24   | 24     | 24     | 24    | 24      | -      | 12-36 | 24     | 24   |     |
| 7  | O, W, C | O, D | E      | W, E/P | O, M  | O, W, C | -      | M, O  | M, O   | OCWD |     |
| 8  | Y       | Y    | Y      | N      | Y     | Y       | N      | N     | Y      | Y    | 12  |
| 9  | O       | O    | O      | -      | M     | M       | -      | M     | O      | M    |     |
| 10 | Y       | Y    | Y      | N      | Y     | Y       | Y      | Y     | Y      | Y    | 16  |
| 11 | D       | D    | D      | N/B    | D     | D       | N      | B     | D      | D/S  |     |

## \* Questions

1. Formal training programme(s) in ICM with documented core competencies. (Y=Yes, N=No)
2. Common multidisciplinary training programme accessible to most of the major specialities, with entry during or after base-speciality training (Y/N)
3. Multidisciplinary training in intensive care medicine under discussion (Y/N)
4. Training is base speciality-specific (i.e.: subspeciality of . . .): A=anaesthesia, I=internal medicine, M=multiple subspecialities
5. Training programme accessible directly after qualification (ie: ICM as a primary speciality) (Y/N)
6. Maximum duration of training in ICM (months)

7. Type of exit examination recognising specialist abilities in ICM: O=oral, M=MCQ, D=dissertation, W=written, C=clinical, E=EDICM, S=supervisor's assessment alone, P=still in planning stage
8. Separate examination in ICM available, independent of base speciality (Y/N)
9. Examination in ICM mandatory (M) or optional (O) for accreditation as specialist
10. Formal inspection of ICUs to determine suitability for training in ICM (Y/N)
11. Accreditation: S=specialist in intensive care medicine, D=dual certification (base speciality)+(ICM), B=single qualification as (base speciality+ICM) for that speciality alone, N=no separate recognition of ICM training

### Postgraduate training in ICM: structure and 'ownership' (Table 1)

All countries offer experience in the practice of intensive care with varying degrees of formalisation. There are formal training programmes in ICM with documented core competencies in 18 (85%) of the 21 countries/regions surveyed. Some of these programmes have been put in place during the last twelve months, and further changes may be expected. For example, the countries of the Nordic region have just started a two-year modular training programme with international exchanges, developed by the Scandinavian Society of Anaesthesiology, and available to anaesthetists who have completed their base speciality training. In 12 (57%) countries/regions, the programme is multidisciplinary, being accessible to trainees from any of the major base

specialities, and intensive care can therefore be described as a 'supra-speciality' in these areas – that is, there is a common training programme which can be taken by any suitably experienced trainee. In six countries/regions (including the Nordic and Arab states), intensive care training can only be obtained through anaesthesia (i.e. a 'sub-speciality' of anaesthesia), but in most of these countries discussions are either planned or are taking place about providing multidisciplinary access to intensive care training.

Four countries appear to have distinctly different approaches to training in ICM, but on closer inspection the training structures fit well into established patterns:

- A. In Spain ICM is a primary speciality with entry directly following completion of undergraduate training and registration. The training period is five

years, but in practice at least half of this is allocated to training in acute medicine and relevant specialities. Between 2 to 2.5 years are generally allocated to intensive care medicine alone, and therefore in this respect Spain does not differ from many other countries.

- B. In France there are two pathways for training in ICM. One is via internal medicine; this is a two year multidisciplinary programme available to trainees from a variety of base specialities (i.e. a 'supra-speciality'). The other is via anaesthesia (a 'sub-speciality'), lasts 1.5 years, and is available only to anaesthetic trainees.
- C. In Germany there are ten base specialities which can offer their own intensive care teaching. In each case the training period is two years, part of which is taken from within the base speciality training time. A common trunk has been developed by a multidisciplinary group, the Deutsche Interdisziplinäre Vereinigung für Intensiv- und Notfallmedizin (DIVI), with representation from each participating speciality, so although the structure is one of multiple sub-specialities, in practice the system reproduces the 'supra-speciality' format, with adaptations to accommodate trainees from different backgrounds.
- D. In the USA, ICM follows a true multiple sub-speciality format, differing from Germany in that there is no nationally agreed common core curriculum, despite the efforts of members of the Society of Critical Care Medicine to establish a multidisciplinary approach [5]. Intensive care training programmes are available through anaesthesia, internal medicine, surgery, and paediatrics, with certification of trainees through the parent discipline Speciality Boards, and accreditation of the training programmes by the Accreditation Council of Graduate Medical Education, to which the various Residency Review Committees report.

#### Duration of training

The recommended duration of training amongst the 18 countries/regions which offer formal training in ICM varies from 1.5 years (Italy, Portugal) to 5 years (Spain), though it should be remembered that in Spain ICM is a primary speciality and in fact half the training time is devoted to acute general medicine. Thirteen countries/regions (62%) have two year training programmes.

Some countries offer two levels of training in order to provide greater flexibility for doctors who may wish to practice intensive care part time in conjunction with another discipline (e.g. anaesthesia, respiratory medicine), usually in the smaller community hospitals. Denmark and Finland offer 3–6 month ICM training modules solely for anaesthetists, to satisfy this requirement.

The multidisciplinary training programmes in Ireland and the UK offer a one year intermediate level training programme, of which half is 'pure' intensive care and the rest is allocated to anaesthesia for trainees from internal medicine or to internal medicine for trainees from anaesthesia. This is followed by the second year of advanced training in intensive care medicine alone, for those wishing to practice ICM predominantly full time. It should be remembered that in these two countries, base speciality training starts *after* a period of 2–3 years at senior house officer grade (general training in a variety of specialities), during which the Royal Colleges of Anaesthetists, Physicians and Surgeons recommend exposure to three months of intensive care. Accreditation as a specialist 'intensivist' is only possible for those completing the full two year training programme however.

Within each national training programme there are variations in the proportion of time which can be taken from the base speciality training period and allocated to intensive care. For example, in Italy training in ICM is obligatory for all anaesthetists, and is taken as one year with an additional two months each year for three years during specialist training in anaesthesia. In Germany, six months exposure to ICM is obligatory for most doctors during their base speciality training, with an additional 1.5 years for those wishing to specialise in ICM. In Austria the ICM training programme lasts 2.5 years; for anaesthetists this is mandatory, and is taken during the six year anaesthetic training, while for internal medicine and surgery the training period is optional and lasts three years of which one can be taken during, and the remaining two must be taken after, base speciality training. In Portugal the programme last 1.5 years, all of which must be taken in addition to the base speciality training time.

#### Content of curricula

It was not the purpose of this survey to examine detailed differences in national recommendations for the core content of an intensive care curriculum. However, available documents demonstrate considerable agreement on the main principles, which are described in the recent recommendations of the European Society of Intensive Care Medicine and of Paediatric Intensive Care [3].

#### Examinations in ICM

All countries/regions assess knowledge of ICM, but the way in which this is conducted varies considerably (Table 1). The only common element is agreement on the necessity of a minimum period of training which must be completed to a satisfactory standard as determined

by the trainee's supervisor. In 13, there is a formal examination which specifically tests knowledge of intensive care medicine independent of the candidate's base speciality; in eight of these this is a mandatory exit examination required for accreditation as a specialist in ICM. Belgium also requires re-evaluation of competence every three years in order to remain on the specialist register. In Austria the examination is mandatory for anaesthetists, as is the training in ICM. In Italy, Sweden, Finland and the Arab Region knowledge of ICM is only tested as part of the anaesthetic exams, with varying degrees of isolation of the intensive care component. Both Sweden and the Netherlands recommend that trainees take the European Diploma of Intensive Care Medicine (EDIC) offered as a two part examination by the ESICM. In Spain, continuous assessment by the trainee's supervisor is employed rather than formal examination.

The EDIC is also recommended informally by certain ICM training programmes in the USA to trainees in emergency medicine, because the American Board of Emergency Medicine does not yet have the right to certify in ICM (as do the four Boards of anaesthesia, internal medicine, surgery, and paediatrics). These four Boards require trainees to pass an MCQ examination; paediatrics and surgery also have an oral examination. In Canada there is no common examination in ICM; knowledge is tested and certification of competence is provided by the individual universities at which the training programmes are based.

In the UK and Ireland, the examination is currently an optional diploma in ICM which can be taken after satisfactory completion of the intermediate year, and which is in addition to the obligatory and rigorous two-part higher professional examinations which the trainee will already have passed in order to enter his or her base speciality training programme. In Australia and New Zealand there are two routes: a formal examination (oral and clinical) for the Fellowship of the Faculty of Intensive Care of the Australian and New Zealand College of Anaesthetists, or recognition of satisfactory completion of training and a research project by the Joint Specialist Advisory Committee in Intensive Care of the Faculty of Intensive Care and the Royal Australasian College of Physicians.

#### Qualification/accreditation in ICM

Spain is the only country surveyed in which ICM is a primary speciality. In all others, ICM is either linked to, or follows training in, a base speciality. Amongst these 20 countries/regions, only Australia and New Zealand offer the opportunity for accreditation solely as a specialist intensivist, and even here dual accreditation is also available. Dual accreditation (base speciality *and* ICM) is offered in 12 countries/regions. All require satisfacto-

ry completion of the training programme before a trainee can be accredited as a specialist in ICM. France offers accreditation in ICM both as a dual qualification via internal medicine, and as a subspeciality of anaesthesia; in Germany it is provided as a subspeciality of all ten specialities which offer training in ICM. All anaesthetists in Austria and Italy receive the combined title of specialist in anaesthesia and intensive care because the training in ICM is mandatory for this discipline. In Sweden ICM is a subspeciality of anaesthesia. In the remainder, ICM is assumed to be the responsibility of anaesthesia, but is not formally identified in the specialist qualification offered on accreditation.

#### System for accrediting ICUs as teaching centres

Sixteen countries/regions have a system of formal inspection of ICUs to determine their suitability for training in ICM. Others either have no formal system, or do so only in the context of anaesthetic training as in the Nordic countries.

#### Discussion

Five significant points of convergence seem to emerge from this survey of training in ICM. The first is that specific training programmes are important. The second is that they should be accessible to trainees from a variety of backgrounds, and that the possession of a base discipline is important. The third is that their duration should be between 18 to 30 months, depending on the prior experience of the trainees, and the fourth is the need for assessment of competence before specialist accreditation. Finally, there is an obvious preference for dual accreditation in both a base speciality and in ICM.

However, there is less agreement about methods of assessment of competence (e.g. formal examinations, continuous assessment), which vary considerably. Spanish trainees can qualify as specialists in intensive care medicine within five years of qualification if they satisfactorily complete the training programme. In the UK trainees must already have passed a rigorous two part examination in their base speciality before entering intensive care training, and can then take an optional diploma in intensive care medicine; they will generally have spent 7–8 years in medical training overall. Belgium has a mandatory exit examination in intensive care, and also requires re-evaluation of competence every three years in order to remain on the specialist register. Resolution of these differences should start with international agreement on a core curriculum [3], on the necessary duration of training, and on the extent of prior training in a base speciality, or training in complementary disciplines other than intensive care.

What is the value of formal examinations in ICM? Methods of assessment of competence will depend on existing national examination structures and the presence or absence of examinations in relevant base specialities. The two-part European Diploma of Intensive Care offered by the ESICM is the only multidisciplinary qualification available in Europe; intensive care knowledge is also tested as part of the examinations for the Academy of Anaesthesiology. The possibility of reciprocal links between the EDIC and national exams in intensive care medicine is being explored at present, and the standards and format of the examination are being revised.

An unresolved issue is how to accommodate those who wish to practice ICM part time in conjunction with their base speciality (e. g. anaesthesia, respiratory medicine), or surgeons who are involved in postoperative intensive care (eg: cardiac, hepatic and neuro-surgery). A substantial proportion of intensive care services are delivered by practitioners working in this way, which offers a cost-effective solution to service provision for many hospitals. The UK offers two levels of intensive care training, one year intermediate and two years advanced training, as described above, with accreditation in ICM only for those trainees who have completed the full two year programme. Denmark and Germany provide six month ICM modules to cater for the 'non-specialist' intensive care practitioner. This requirement for intermediate training is likely to persist for many years, and needs to be taken into account in national programme development. It should be supplemented by recommendations for continuing education, and the appointment within each ICU of a lead intensivist with full accreditation.

As far as 'ownership' of intensive care is concerned, there are three approaches. The 'superspeciality' format

of multidisciplinary access to training and clinical practice is the most common, being available in 57% of the countries/regions surveyed. Subspeciality status is the next most frequent, with anaesthesia or respiratory medicine being the main parent disciplines, though the extent to which this is formalised varies. Finally, ICM is a primary speciality in Spain. Although these differences may appear substantial, closer inspection shows many opportunities for the collaborative development of a common approach to intensive care training. Several countries have established intercollegiate or interspeciality committees in order to foster a multidisciplinary approach to training in ICM, allowing intensive care to become a 'supra-speciality', in that the training would be obtained in addition to a base speciality, with dual accreditation. We would commend this type of collaborative development, and hope that the European Commission will develop a mechanism for recognising supra-speciality training programmes. Giving intensive care the status of a multidisciplinary speciality will contribute greatly to standards of practice, research, and undergraduate and postgraduate education.

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