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ARTIGO DE PERSPETIVA

Anesthesia Education in Belgium: Pathways, Processes, and Perspectives

Formação em Anestesia na Bélgica: Percursos, Processos e Perspectivas

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INTRODUCTION

Belgium is a federal constitutional monarchy located in Western Europe. The country is divided into three regions: Flanders in the north, Wallonia in the south, and the Brussels-Capital Region, a bilingual enclave within Flanders. The three official languages are Dutch (in Flanders), French (in Brussels and Wallonia), and German, spoken by a small community in eastern Wallonia. The federal government shares power with regional governments, each having legislative and executive branches.

Medical education varies significantly from country to country but generally follows a similar curriculum structure worldwide. This typically begins with a lecture-intensive pre-clinical phase, followed by clinical rotations across various medical specialities.[1] Upon earning a medical degree, further postgraduate training is often required to achieve specialisation in specific fields.

In Belgium, medical training starts with a three-year Bachelor of Medicine program (180 European Credit Transfer and Accumulation System (ECTS) credits), focusing on basic medical sciences and theoretical knowledge. This is followed by a three-year Master of Medicine program (180 ECTS credits), which includes clinical rotations and further theoretical deepening. After obtaining a Master of Medicine, graduates earn the title of medical doctor (MD) and can apply for an advanced master's degree. This advanced degree program consists of 180 ECTS credits. In addition to earning the advanced Master's degree, students simultaneously undergo professional medical residency training, lasting three to six years, depending on the chosen medical speciality.[2]

Seven hospitals are associated with a university. They are crucial to the clinical training in Belgium. There are four predominantly Dutch-speaking hospitals: Antwerp University Hospital, Ghent University Hospital, University Hospital Brussels, and University Hospital Leuven. Additionally, there are three French-speaking university hospitals: CHU de Liège, Cliniques Universitaires Saint-Luc, and Hôpital Erasme.

This article focuses on the advanced Master's degree and residency training, providing an in-depth overview of the pathway to becoming an anesthesiologist in Belgium. We examine the selection procedure and training process, highlighting the distinctive features of the Belgian system and its effectiveness in preparing practitioners for the field.

ACCEPTANCE INTO AN ANAESTHESIA RESIDENCY

After earning the title of medical doctor, individuals can pursue further training in general medicine, community medicine (public health), or a specialised medical field. To become an anaesthesiologist in Belgium, one must obtain an advanced Master of Medicine in Specialist Medicine - Anaesthesia and Resuscitation while simultaneously completing five years of residency training.

The "Planning Commission Medical Supply" determines the number of medical doctors who can begin specialist training each year. Operating under the Federal Public Service of Health, Food Chain Safety, and Environment, this commission assesses specialist demand by analysing demographic data, healthcare needs, and future trends. Based on their findings, they recommend the number of doctors to be trained in various specialties. Each university hospital is then allocated a portion of these training spots, proportional to the number of medical graduates from each university in the previous year.

To gain access to the subsequent Master in Specialist Medicine and residency training in Belgium, a university

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hospital must accept individuals into a residency program. Each hospital has the autonomy to choose its criteria for evaluating and selecting candidates, such as knowledge and skills demonstrated during medical student internships, grades obtained during the Master of Medicine, and the quality of their thesis.[3] Each university hospital assigns different weights to the criteria and can independently select candidates for their available spots. Candidates can apply for positions at any university hospital, not necessarily the one affiliated with the university where they obtained their Master's degree.

ANAESTHESIA RESIDENCY

Upon acceptance into a residency program, students also enrol in the corresponding Master's program in specialised medicine, such as the Master in Specialist Medicine - Anaesthesia and Resuscitation or the Master in Specialist Medicine - Surgery. This dual enrolment allows residents to integrate theoretical knowledge with practical skills, interpersonal skills, and management abilities as outlined in the CANMEDS framework.[4]

Anaesthesia residency in Belgium typically spans five years. To become an anaesthesiologist, candidates must meet the recognition criteria outlined by the "Supreme Council of Physician Specialists and General Practitioners." This federal body, composed of Dutch- and French-speaking representatives, establishes the standards for training and certification across the country. There are general criteria[5] for recognition as a specialist doctor, such as the requirement for a scientific publication. Additionally, there are specific criteria tailored to each specialisation. For anaesthesiology specifically, the law requires that candidates possess the following competencies by the end of their training[6]:

- A comprehensive theoretical and clinical knowledge base, including pharmacology, physiology, biochemistry, anatomy, and infection control. This must also encompass specialised knowledge in cardiology, pulmonology, and blood product management, among other areas;
- In-depth knowledge of general, locoregional and regional anaesthesia techniques;
- Experience in advanced life support and intensive care.

Furthermore, the law mandates that candidates maintain a detailed log of their activities throughout their residency. Most candidates use Medbook,[7] a digital portfolio, as their logging system of choice. Additionally, it specifies that the required scientific article must be in a domain related to anaesthesiology. To evaluate whether a candidate meets the federal requirements for recognition as an anaesthesiologist, each region (Flanders and Wallonia) has established an accreditation committee. This committee, composed of anaesthesiologists from university and non-university anaesthesia departments, ensures that recognition as a specialist is granted only when all criteria are fully satisfied. The accreditation committees refine the federal requirements to assess the federal criteria effectively. For instance, the Flemish accreditation committee[8] mandates that candidates need to pass the first part of the European Diploma in Anaesthesiology and Intensive Care (EDAIC) examination. At the end of their residency, candidates must also pass an Objective Structured Clinical Examination (OSCE) to demonstrate their theoretical and clinical knowledge. To ensure sufficient experience in advanced life support and intensive care, anaesthesiologists in training must complete a 12-month rotation in the emergency and intensive care departments, with a minimum of three months in the emergency department and six months in an intensive care unit. It is important to note that the local residency program determines the specific methods used to train anaesthesiologists to meet these requirements. Consequently, some departments emphasise theoretical knowledge through weekly lectures, while others focus more on developing clinical skills through simulation-based education.

MASTER IN SPECIALIST MEDICINE

The Master in Specialist Medicine is structured around the four major roles of a medical specialist: medical expert, scientist, manager, and communicator. Considering the wide variety of specialisations, the study program offers general competencies shared by all specialist medical practitioners and supplements these with discipline-specific competencies. Topics include the organisation and management of care processes, communication, and personal development. At the end of the Master's program, candidates must write a dissertation, which often aligns with the subject of the scientific article required for recognition as a specialist.

ANAESTHESIA EDUCATION IN BELGIUM – STRONG POINTS

Adequate supervision

Anaesthesia training is highly practical, requiring individuals to quickly learn and perform numerous procedures in a semi-autonomous manner. Despite this steep learning curve and rapid acquisition of autonomy, supervision remains essential for patient safety. In their article titled "Belgian Standards for Patient Safety", Bonhomme *et al* stipulate that every anaesthesiology trainee must be supervised by a certified anaesthesiologist,[9] preferably in a one-on-one capacity. Generally, all residency programs strive to adhere to these safety standards.

Substantial input via trainee organisation

The Belgian Anesthesia Trainees (BAT) is a non-profit organisation representing the interests of all Belgian anaesthesia residents.[10] It serves as a liaison between trainees

and residency programs and advocates for trainees at the governmental level. In recent years, BAT has facilitated significant progress in improving working conditions, including properly implementing labour laws and better remuneration for work performed.

Online logging system

As previously mentioned, trainees must log all their activities during residency, including clinical activities, scientific pursuits, and evaluations. This process used to involve maintaining a paper logbook. However, in recent years, Medbook, an online logging system, has gained popularity. Medbook allows residents to document their activities using templates and provides a structured format for supervisor evaluations. This transition to a digital platform has significantly reduced the administrative burden and streamlined the documentation process.

ANAESTHESIA EDUCATION IN BELGIUM – CHALLENGES

In an era of increasing digitalisation and the rise of artificial intelligence, human knowledge and technology are advancing at an unprecedented rate. The impact of this information revolution is becoming increasingly evident in the medical field. While the doubling time of medical knowledge was 50 years in 1950, it accelerated to 19 years by 1991, 3.5 years by 2010, and just 73 days by 2020.[11] This evolution in the medical world is fascinating, but it also presents significant challenges and compels us to rethink our traditional approach to medical education.

From time-based to competency-based education

Anaesthesiology training in Belgium traditionally follows a time-based model, where residents advance through their training by accumulating experience over a set period. They are expected to manage increasingly complex procedures and interventions as they progress. Recently, there has been a shift towards Competency-Based Medical Education (CBME), which aligns with a global movement emphasising learner-centred and lifelong learning.[12]

CBME improves procedural skills and increases attention to non-technical skills, such as communication, teamwork, and decision-making.[13] However, this shift is not without challenges. There remains a lack of evidence regarding best practices in CBME.[13] Additionally, logistical issues arise as CBME demands more from faculty who must balance educational responsibilities with clinical duties. The lack of a unified Belgian framework for implementing CBME means that the responsibility falls on individual residency programs, resulting in potential variations in quality. Adopting the Anaesthesiology European Training Requirements as a foundation for a CBME residency program could provide valuable guidance for development and ensure comparability between programs.[14] The Entrustable Professional Activity (EPA) framework can be used to assess CBME.[15]

Simulation Education in Residency Training

The benefits of simulation training during residency are well documented.[16] It allows trainees to practice technical and non-technical skills in a safe environment. However, similar to Competency-Based Medical Education (CBME), there are still questions regarding the best methods to incorporate simulation education into the learning environment.[17] Guidelines and legislation are needed to ensure implementation. Other barriers to implementing simulation education include time constraints, lack of resources, and shortage of funds.[18]

CONCLUSION

In conclusion, the Belgian anaesthesiology training program is a well-structured and evolving system that emphasises practical training and patient safety. Supervision by certified anaesthesiologists, as mandated by safety standards, ensures that trainees develop skills safely. The transition to digital documentation through Medbook has streamlined administrative processes. However, the rapid advancement of medical knowledge and technology challenges traditional training approaches. The shift from time-based to competency-based medical education promises improved procedural and non-technical skills, but it faces logistical challenges and requires a unified framework for consistent implementation. Addressing these challenges will enhance and modernise anaesthesiology training in Belgium.

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AS, BB and DV: Conception, writing, supervision and critical revision of the manuscript

QT: Conception and writing of the manuscript

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