To fully understand the present state of surgery in Belgium, it is necessary to know the structure of the Belgian State, the type of education, the statutory health insurance system, and the professional bodies representing surgeons. One of the most important problems is the excessive number of physicians, which recently led to the establishment of limits on the number of candidates receiving medical certification. Surgical training modalities are described and the results of a retrospective study concerning the quality of training are detailed. The continuing medical education and peer-review system (accreditation) is presented.

The structure of the Belgian State

In 1993, the unitary Belgian State was transformed into a federal state. The opening lines of Article 1 of the Belgian constitution read, “Belgium is a federal state, composed of communities and regions.” The communities are empowered with regard to the so-called personalized matters and culture, which include education.

Recent developments affect the health care system, training, and the accreditation program of surgeons. The federal kingdom is composed of 3 geographic regions (Flanders, Wallonia, and Brussels) and 3 cultural communities (Flemish, French, and German). The federal government and the regions and communities have their specific responsibilities in regard to health care. The regions and communities have responsibilities concerning provision of health care for the population; at the federal level, the Ministry of Public Health is responsible for health insurance and hospital legislation.

Educational matters are the concern of the communities, so it is the Ministry of Education of each community that regulates the undergraduate education of medical students, whereas specialist training is regulated at the federal level. Thus, the health system in Belgium is a complex entity, and health planning and programming are difficult.

Education in Belgium

For Belgian boys and girls, basic education starts at the age of 3 years and continues through 12 years of age. After basic education, youngsters attend secondary school up to the age of 18 years, after which they may enroll in the medical faculty of 1 of the 7 universities (Université Libre de Bruxelles, Brussels; Université Catholique de Louvain, Louvain; Université d’État de Liège, Liège; Katholieke Universiteit Leuven, Louvain; Vrij Universiteit van Brussel, Brussels; Rijksuniversiteit Gent, Ghent; and Universitaire Instelling Antwerpen, Antwerp).

Until recently, for entry into a medical school, only a diploma of secondary education was compulsory for Belgians, an analogous national certification for other European citizens, or a certificate recognized as equivalent by law, decree, a European directive, or an international treaty.

The medical curriculum is composed of 2 cycles, consisting of 3 and 4 years, respectively. During the first year, students study a survey of philosophy, basics of mathematics, physics, chemistry, and biology. The normal human is the major subject of
The dispensing of medical care is monitored by the Central Medical Control Service of the National Institute for Sickness and Invalidity Insurance, which oversees the control functions exercised by the advisory medical officers of the societies. In this way medical practitioners are supervised by their peers.

Private medicine has an important place in the health care system. Free choice of medical practitioner and a fee-for-service scale for reimbursing medical care expenses are important features of health care in this country.

**MEDICINE AND SURGERY IN BELGIUM AS OF JANUARY 1, 1997**

From 1956 to 1997, we observed an increase in the number of physicians from 9937 to 38 690. As of January 1, 1997, 91% of physicians were in clinical practice, 46.5% were specialists, 43.7% were general practitioners, and 9.9% were specialist candidates. From 1987 to 1997, there was an increase of 35% for specialist candidates and 10% for general practitioners. **Table 1** gives the surgical situation in Belgium as of January 1, 1997.

In all surgical specialties, the percentage of women among trainee surgeons is increasing. When the age distribution among surgeons is examined, the youngest practitioners are found in plastic surgery, then urology and orthopedics, while the oldest are in neurosurgery and general surgery.

**THE PLETHORA OF PHYSICIANS**

In Belgium the number of physicians is at present 38 690, representing an almost 4-fold increase during the last 40 years. The number of inhabitants per physician decreased from 850 to 262 in the same period (3.4 times fewer). The number of physicians per 100 000 inhabitants was 387 as of 1997. This number has increased from 120 in 1966. Belgium ranked third (behind Italy and Spain) among European countries in the number of physicians per 100 000 inhabitants in 1989, and it has maintained this position. Belgium has more than twice as many physicians per 100 000 inhabitants than Ireland; Italy is at the top of the European rank, with 3 times more physicians per 100 000 than in Ireland.

The increase in Belgium is steady and more pronounced for specialists than for general practitioners, as can be seen from the Belgian figures for 1990 through 1993: an increase of 8% among specialists and 2% among general practitioners.

With the Act of April 26, 1996, Belgian authorities finally accepted the principle of limiting the number of physicians. A federal commission was established to examine the needs in terms of medical personnel and to suggest quotas accordingly. The present number of 1064 new physicians certified per year will be reduced to 700 in 2004, 650 in 2005, and 600 in 2006.

The second part of the new regulation concerns the implementation of a mechanism to achieve this reduction. However, since education is no longer a federal matter, but a responsibility of the communities, 2 approaches emerge. In Flanders a decree on July 24, 1996, introduced, as of the academic year 1997-1998, a compulsory interuniversity entrance examination as a condition of entry to the medical school. The entrance examination aims at testing the competence of the medical student has the opportunity to choose 1 of 4 branches: general practice, prespecialization, public health, or research. At this stage, he or she is graduated with the degree MD and can embark on training as a specialist or in general practice.

**THE STATUTORY HEALTH INSURANCE SYSTEM**

Compulsory health insurance for employees was introduced in Belgium by law in 1945 as part of a statutory sickness and invalidity scheme, operated through a reorganized structure of mutual benefit societies. These organizations have existed for many decades, providing health insurance on a voluntary basis to people of various political and occupational affinities. In 1945, when health insurance became compulsory for all employees, it was decided to preserve these societies and use them to run state health insurance. At a national level, they were grouped together into 5 confederations with specific affiliations: Christian, socialist, liberal, professional, and neutral. A sixth independent state carrier, the National Sickness and Invalidity Insurance Fund, was created to care for insured persons who wanted to join a society without political or philosophical connotation. Unlike this national fund, the mutual benefit societies are private organizations selected by the patient, but they operate under identical rules for benefits, contributions, and refunds. The management, at a national level, belongs to the National Institute for Sickness and Invalidity Insurance. This institute collects the money from the taxpayer and passes it on to the mutual benefit societies and to the national fund.

Medical care coverage was progressively extended through the years, the most important being the addition of a scheme for the self-employed in 1963. Today almost the whole population is protected by an insurance system managed by the National Institute for Sickness and Invalidity Insurance. One of the main features of this health system is the important place occupied in it by the private sector.

**Table 1. Surgeons in Belgium as of January 1, 1997**

<table>
<thead>
<tr>
<th>Surgical Discipline</th>
<th>Recognized Surgeons</th>
<th>No. (%) Who Were Trainee Surgeons</th>
</tr>
</thead>
<tbody>
<tr>
<td>General surgery</td>
<td>1402</td>
<td>348 (24.8)</td>
</tr>
<tr>
<td>Orthopedic surgery</td>
<td>730</td>
<td>173 (23.7)</td>
</tr>
<tr>
<td>Urology</td>
<td>293</td>
<td>48 (16.4)</td>
</tr>
<tr>
<td>Plastic surgery</td>
<td>120</td>
<td>23 (19.2)</td>
</tr>
<tr>
<td>Neurosurgery</td>
<td>102</td>
<td>24 (23.5)</td>
</tr>
<tr>
<td>Total</td>
<td>2647</td>
<td>616 (23.3)</td>
</tr>
</tbody>
</table>

MEDICINE AND SURGERY IN BELGIUM AS OF JANUARY 1, 1997

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students to round off successfully a medical or dental education.

The examination consists of 2 parts: (1) knowledge and understanding in sciences, namely, physics, chemistry, mathematics, and biology; and (2) the capacity of acquiring and processing information relating to the professional practice of physicians or dentists. The examination will be held twice a year and students will be allowed to compete twice.

The French-speaking community introduced a totally different system. The students will not be selected at entry into medical studies, but 3 years later, at the end of the first cycle. A jury in every French-speaking university will evaluate the candidates during the 3 candidates, taking into account their academic results, their capacity to practice medicine, their participation in academic activities, contacts with patients, and the integration of basic science in clinical activity. A certificate will be granted to the successful candidates, which will be a mandatory condition to proceed to training as general practitioner or specialist after obtaining the physicians’ diploma (at the end of the second cycle).

THE SETTING FOR THE SURGICAL PLAY

It is clear that one of the more dramatic changes we are confronted with in Europe, and especially in Belgium, is the excess of physicians and medical specialists.

Not only are we much more numerous, but the specialist’s practice has become much more complex. The training includes a multitude of requirements, a massive administration (logbook, audit, etc), in-training examination, final assessment, scientific papers, etc. The specialist practice implies continuous efforts and stress from the daily confrontation with the hospital management, the problems surrounding up-to-date instrumentation and its rising costs, the subtle distinction between aggressive therapy and a less efficient but safer attitude, the fear of litigation, the rising insurance fees, and the medical or surgical audit, not to mention the neglected family.

The surgical or specialist’s work has been transformed. In one single career, therapeutic approaches, anesthetia, indications, and techniques have changed more than during the previous whole century. eg. the revival of local anesthesia, the disappearance of ulcer or conventional reflux surgery, the boom in laparoscopic surgery, and endovascular procedures. Our surgical strategies have to be modified constantly. Adaptability has become a major requirement for the modern surgeon.

In 1997, there were 1402 surgeons in Belgium; if a limit on the number is not instituted, there will be 1834 surgeons in the year 2017 and 2167 in 2042. This medical plethora is, however, balanced by aging and feminization, 2 factors linked with less activity. This means that in specialties where there are fewer women, the excess of physicians is all the more deeply felt (eg, orthopedics and urology).

The number of surgeons practicing is a factor that influences individual surgical activity. A sufficient level of activity is a guarantee of sufficient experience and good professional practice. Decrease of individual activity decreases professional experience. To avoid increasing the excess, it will be necessary to limit the number of trainee surgeons to 33 per year.

THE STRUCTURES

On the national level, 4 types of representative surgical groupings exist: (1) the scientific ones: Royal Belgian Society for Surgery, Belgian Association of Cardiothoracic Surgery, Belgian Association of Surgical Oncology, Belgian Association of Surgical Trainees, Belgian Association of Vascular Surgery, Belgian Group of Endoscopic Surgery, Belgian Trauma Society, and Belgian Association of Pediatric Surgery; (2) the professional one: Professional Union of Belgian Surgeons; (3) the Consilium Chirurgicum Belgicum; and (4) the ministerial ones: High Council for Medical Specialists and General Practitioners, and the French and Flemish Commission for Recognition.

Royal Belgian Society for Surgery

The Royal Belgian Society for Surgery was created in 1893 and celebrated its first centenary in 1993. The aim of the society is study, progress, teaching, and the promotion of surgical meetings. It organizes 3 scientific meetings each year, 2 postgraduate trainee courses, and a national congress. It publishes a journal, Acta Chirurgica Belgica.

The society awards 3 prizes:

1. An annual prize (prize of the Royal Belgian Society for Surgery; André Duprez Prize) in memory of a late former general secretary who proposed its creation. This prize of BF 100 000 rewards the first author (corresponding member younger than 40 years) of the best article published in Acta Chirurgica Belgica in the past year.

2. A triennial prize (prize of the president of the Royal Belgian Society for Surgery; René Kiekens Prize) in memory of a former president who died during his term. This prize is worth BF 150 000 and rewards a clinical or experimental study leading to an advance in surgery.

3. An annual prize called “Award of Young Surgeon’s Publication,” worth BF 50 000, for the best article published by a trainee during the previous year in Acta Chirurgica Belgica.

The Royal Belgian Society for Surgery has in recent years initiated various scientific associations (Belgian Association of Surgical Oncology, Belgian Association of Surgical Trainees, Belgian Trauma Society). It also collaborates with other scientific societies (Belgian Association of Cardiothoracic Surgery, Belgian Association of Vascular Surgery, Belgian Group of Endoscopic Surgery, Belgian Society for Pediatric Surgery). It participates in the work of the Professional Union and the Consilium Chirurgicum Belgicum.

Belgian Surgeons Professional Union

In defense of the individual rights of its members and without prejudice to the rights of these to act directly themselves, the union can go to court either to defend...
Surgical Training Modalities in Belgium

Before 1953, no regulations concerning surgical training existed. In 1955, the Professional Union of Belgian Surgeons established criteria for surgical recognition by the surgeons. In the 1960s, the government, through the Ministry of Public Health, issued regulations concerning the accreditation of 25 medical specialties. The scope of training in each of these specialties is set by law on the advice of the High Council for Medical Specialists and General Practitioners, whose members are appointed by the Minister of Health. For each specialty, a commission for accreditation monitors training and gives advice to the Minister of Health as to the issue of a certificate of completion of training. Each commission is composed of 2 chambers, one for each linguistic community.

Surgery as a whole has been divided into 5 official surgical specialties: surgery, orthopedic surgery, plastic surgery, urology, and neurosurgery. The possibility for the commissions to issue additional certificates for particular competences in the different fields of each specialty has also been incorporated in its mission.

The requisites with regard to the quality of the training, the trainers, and the training centers were fixed by law on July 18, 1979. A distinction is made between basic surgical training of variable length (4 years in general surgery; 2 or 3 years in orthopedic surgery, urology, and plastic surgery; and 1 year in neurosurgery) and a higher surgical training (2 years in general surgery, 5 years in neurosurgery, and 3-4 years in the other cutting specialties). It should be noted that the 4-year basic training in general surgery represents more than a rudimentary exposure to general surgery, and must be considered as a valid training of such length in this field. One year of surgical training abroad is allowed. The majority of candidates for a surgical career are selected at the end of the medical curriculum (7 years) in the 7 medical schools, but a freelance training program is possible.

The criteria for the trainers are 8 years of surgical experience, responsibility for the organization of weekly seminars, supervision of the activities of the trainee, the provision of the possibility of scientific work, an annual report concerning each trainee, the allocation of 25 beds per 1 to 3 trainees, a clinic and an emergency department, and a minimum of 1 coworker per 50 beds.

For complete training, training centers must be able to offer a staff meeting room, a medical library, a sufficient administrative infrastructure, a broad activity in the various surgical areas, 100 beds, a minimum of 1500 operations per year, a clinic with 2000 new cases per year, and involvement in emergency and intensive care. For partial training, the center must offer 50 beds, 750 operations per year, and 1000 new patients at the clinic, together with facilities similar to those of the above training centers. Patient registration and operative notes are compulsory.

Training is controlled by the 2 Commissions of Recognition (Flemish and French). The commissions are composed of a parity of university professors and representatives of the professional organization.

The commission verifies the training program of each candidate (which must be provided before the training is started), an annual logbook, and the annual reports written by both the trainer and the trainee. At the end of the training, all the documents of the candidate (opinion of the coordinating trainer, original article or paper delivered in a scientific meeting as first author, fulfillment of the conditions of the catalog of interventions, passing of the theory examination at the end of the course) are verified by the commission for certification.

During the whole 6-year training period, the trainee is gradually given increased responsibility and performs operations of increasing difficulty under the close supervision of the full-time staff members. Trainees must keep logbooks in which they note all the operations they perform themselves or assist with. They must also note all the meetings, courses, and seminars they attend.

Trainees must present at least 1 paper in a scientific meeting or publish an article in a peer-reviewed medical journal during the training period. The training must be pursued on a full-time basis in a Belgian surgical department. On special request, the specialty board may al-
low a training period of maximum 1 year in a foreign de-
partment, provided this department is accredited as a
training center.

The specialty board supervises the training period
by annual inspection of the trainee’s logbook and by ap-
proval instructor’s report, controlling the progress in edu-
cation and the distribution of the training among surgi-
cal subspecialties.

Eventually, the board may modify the training sched-
ule and even propose to prolong the training period. The
trainee may appeal against this resolution to the super-
vising high council. At the end of the training period, the
specialty board certifies that the trainee is “apt to practice
surgery, independently, under his own responsibility.”

The Ministry of Health confers on the trainee a Certifi-
cate of Specialist in General Surgery after his or her 6-year
training program has been successfully completed.

To summarize, after graduating as a doctor of medi-
cine, a candidate for training in general surgery submits
a training program to the specialty board for general
surgery. This program must be pursued in approved surgi-
cal departments under the direction of approved in-
structors. The candidate contacts the instructors, and the
application is accepted or rejected by an individual in-
structor or by a local committee of instructors after an
interview of all candidates for the post.

From the time of Billroth until 4 decades ago, the
surgeon practiced the whole scale of surgical treat-
ments, including visceral and fracture surgery, urology,
neurosurgery, orthopedics, and thoracic surgery. Pres-
cently, our young colleagues are almost compelled to
acquire a very specialized profile if they want to seize a
position in one of our hospitals.

STUDY CONDUCTED IN THE FRENCH-SPEAKING
PART OF THE COUNTRY

We conducted a retrospective study of the files of 16
trainee surgeons who obtained their degree in surgery
after 6 years of training in the French-speaking part of
the country. The results are given in Table 2 and
Table 3.

The catalog currently used by the French-Speaking
Community Recognition Commission (Table 4 and
Table 5) will soon be used by the Flemish Community
Recognition Commission. Currently the data of each new
recognition are recorded to update annually the catalog.
The catalog is eventually adapted according to new
techniques (eg, celioscopy or endovascular surgery).

Training centers are visited every 5 years by a com-
mission composed of 3 members of the Recognition Com-
munity and 2 members of the High Council. These de-
partments are revisited at each renewal of the responsible
trainer.

According to a survey conducted within the Min-
istry of Health,6 the average number of working hours
of a trainee surgeon is 9.93 hours a day. Trainee sur-

<table>
<thead>
<tr>
<th>Surgical Discipline</th>
<th>Average, %</th>
<th>Range, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digestive</td>
<td>37.9</td>
<td>32.9-51.2</td>
</tr>
<tr>
<td>Orthopedics-traumatology</td>
<td>19.7</td>
<td>10.9-24.3</td>
</tr>
<tr>
<td>Vascular</td>
<td>11.7</td>
<td>10.8-12.8</td>
</tr>
<tr>
<td>Thoracic</td>
<td>7.5</td>
<td>4.4-10.2</td>
</tr>
<tr>
<td>Urology</td>
<td>6.0</td>
<td>4.1-9.5</td>
</tr>
<tr>
<td>Gynecology</td>
<td>0.8</td>
<td>0.8-0.9</td>
</tr>
<tr>
<td>Others (plastic, ENT†, stomatology, etc)</td>
<td>16.2</td>
<td>11.1-21.8</td>
</tr>
</tbody>
</table>

* Percentage of the total procedures in which the surgeon has participated.†ENT indicates ear, nose, and throat.

Table 3. Activity of Trainee Surgeons During 6 Years of Training

<table>
<thead>
<tr>
<th>Surgical Discipline</th>
<th>No. of Procedures as Leader</th>
<th>% of Procedures in Which Trainee Participated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digestive</td>
<td>280</td>
<td>15</td>
</tr>
<tr>
<td>Vascular</td>
<td>100</td>
<td>20</td>
</tr>
<tr>
<td>Venous</td>
<td>70</td>
<td>25</td>
</tr>
<tr>
<td>Arterial</td>
<td>30</td>
<td>45</td>
</tr>
<tr>
<td>Bone surgery</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>Traumatology</td>
<td>70</td>
<td>40</td>
</tr>
<tr>
<td>Orthopedics</td>
<td>30</td>
<td>45</td>
</tr>
<tr>
<td>Cardiothoracic</td>
<td>50</td>
<td>25</td>
</tr>
<tr>
<td>Urology-gynecology</td>
<td>50</td>
<td>45</td>
</tr>
<tr>
<td>Endocrinology</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>Breast surgery</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>Others</td>
<td>130</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>750</td>
<td>50</td>
</tr>
</tbody>
</table>

*Minor interventions, 625; major interventions, 125.

Table 4. Number of Procedures to Be Carried Out as Leader by a Trainee Surgeon According to Surgical Discipline

Table 5. Number of Procedures to Be Carried Out as Leader by the Trainee Surgeon According to Year of Training

<table>
<thead>
<tr>
<th>Year of Training</th>
<th>No. of Procedures as Leader</th>
<th>% of Procedures in Which Trainee Participated</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>45</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>80</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>100</td>
<td>25</td>
</tr>
<tr>
<td>4</td>
<td>155</td>
<td>40</td>
</tr>
<tr>
<td>5</td>
<td>170</td>
<td>45</td>
</tr>
<tr>
<td>6</td>
<td>200</td>
<td>50</td>
</tr>
</tbody>
</table>
geons spend approximately 25.6 hours on duty per week. The average salary of a trainee surgeon is BF 46,925 per month. Of trainee surgeons, 97.5% of those who qualify find work; 26% do part of their training abroad.

A new bill has been drafted that proposes to limit the working hours of a trainee surgeon to 44 hours a week with a 24-hour recuperation period after 24 hours on duty and allowing 4 hours per week for scientific work. If this bill is passed, it is likely that the training period of a surgeon will have to be prolonged to 7, 8, 9, or even 10 years.

ACREDITATION AND RECERTIFICATION

A continuing medical education system was adopted in 1994. It is managed by the Accreditation Steering Group, which has equal representation of physicians from the professional organizations and the sick funds, supplemented by experts from medical faculties and scientific societies. The role of the Accreditation Steering Group is to approve the continuing medical education programs proposed by the joint committees and to define the basic requirements for continuing medical education and the proportion of ethics, health economy, and use and quality of health care. Moreover, the Accreditation Steering Group decides on the minimal level of medical activity, the guidelines for quality evaluation and peer review, and directives concerning medical records and the local peer review groups.

The Joint Committee (Comité paritaire) for each discipline is composed of equal numbers of physicians representing the professional associations and physicians delegated by the universities and the scientific societies. The task of this committee is to evaluate the continuing medical education program, to monitor implementation, and to propose a minimal level of activity. The individual physician or specialist can apply for accreditation by submitting an accreditation attestation and the attendance certificate. A mechanism of appeal is provided, as well as a moderate preferential honorarium and a financial compensation for the cost of continuing medical education.

On January 31, 1997, there were 9097 accredited general practitioners and 11,242 accredited specialists.

THE FUTURE

Explosion of new technologies, such as 3-dimensional visualization of anatomy, virtual reality, surgical simulations, and virtual prototyping of surgical equipment and operating rooms, will modify the surgeon’s environment (preoperative diagnosis, surgical procedure, and surgeon’s education) in the year 2000.

Preoperative 3-dimensional reconstruction, telebotics (computer-guided robot, voice-controlled robot) in operating theaters, ultrasound stereoimaging, teleoperation, computer-assisted surgical procedures, telemanipulation, and image-guided surgery will represent a revolution in the development of surgery. These combined technologies and the miniaturization of surgical instruments will increase the quality of minimally invasive surgical procedures.

New surgical approaches will certainly appear. Examples include development of multidisciplinary treatments in digestive surgery (preoperative, intraoperative, and postoperative radiochemotherapy); in utero video surgery; endoscopic lifting, cutaneous substitutes for burn therapy, and laser therapy in plastic surgery; tissue engineering, biomaterials, and computer applications in orthopedic surgery; intracerebral embryonic cell grafts, stereotactic surgery, radiosurgery, and computer-aided navigation in neurosurgery; transperitoneal celioscopic resection of suprarenal tumors and video-assisted cervicotomy in endocrine surgery; an increase in ambulatory surgery; endoprosthesis in vascular surgery; video-assisted thoracoscopy, phototherapy, and brachytherapy in thoracic surgery; coronary bypass on the beating heart, minimally invasive surgery for valvular abnormalities and simple congenital defects, and intracardiac video-assisted surgery in cardiac surgery; and in the field of transplantation, artificial liver, lung, and heart, veno-thromplantation, and celioscopy for kidney live donors.

The dawn of the third millennium brings exciting times for surgeons, with more problems of ethics, competence, and responsibility and an increasing importance of the patient’s informed consent.

Dr Mendes da Costa is past-president of the Royal Belgian Society of Surgery; Dr Detry, president of the Consilium Chirurgicum Belgium; Dr Gruwez, president of the Professional Union of Belgian Surgeons; Dr Harper, trainee’s surgeon; and Dr Ratten, president of the Recognition Commission for General Surgery.


REFERENCES