

Surgery in the Netherlands

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Surgery in the Netherlands is performed by 700 surgeons in 148 hospitals that serve a population of more than 15 million. Surgical standards are high and among the best in Western medicine. Training in surgery requires 6 years. In 1998, one third of the medical doctors applying to the surgical training program were women. The practice of surgery and surgical training are under pressure by the government to limit the working hours of residents, to reduce the number of hospitals, and to reduce medical budgets.

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Surgery in the Netherlands has a long history dating back to the 12th century. The French and German surgical schools have served an important role in the development of Dutch surgery through the centuries. During the second half of the 20th century, health care in the Netherlands has been subjected to strict organization and regulation by the government. Health care is available for all Dutch citizens on an equal basis. However, governmental involvement in health care also has resulted in the reduction of hospital beds, a severe reduction in the working hours of residents, and restricted medical budgets. This article reviews the evolution of surgery in the Netherlands, its current status, and perspectives.

HISTORY

The Netherlands is a small European country with a population of 15 million, surrounded by Germany, Belgium, and the water of the North Sea. The boundaries of the Netherlands have changed continuously during many centuries. Early in the 12th century, the Low Countries were divided into the Northern and Southern Netherlands, separated by the river Maas. Flanders (the northern province of contemporary Belgium), Brabant, and Zeeland composed the Southern Netherlands. Trade and industry flourished in the Southern Netherlands in the 12th and 13th centuries owing to transit trade with En-

gland and the manufacturing of English wool into cloth. Holland, the western part of the Northern Netherlands was economically unimportant in those days. Utrecht, Tiel, and the Hanseatic towns along the river Yssel (towns banded together for mutual protection and trade advantages) were the major trading centers of the Northern Netherlands.

The first report of surgery in the Low Countries dates back to the middle of the 12th century. Count Arnold I of Flanders suffered from a bladder stone. Several surgeons gathered at the court to relieve the count of his ailment. However, despite a public demonstration of their skills, the count declined surgical treatment. During the 13th and 14th centuries, the cities of the Low Countries appointed town-surgeons to provide care for the poor.¹ The town-surgeons also were required to treat persons who had undergone corporal punishment and to accompany the militia. The salary of the town-surgeons was in coins, fabric, and an exemption from the excise on spirits.

During the 15th century, an important role began for Holland and Zeeland in the shipping traffic with the Baltic countries and the industrial countries in western Europe. Amsterdam was among the flourishing cities in Holland, although it was merely a small fishing village during the 12th century. During the 15th century, Charles V inherited from his parents and his Hapsburg grandfather, Maximilian I of Austria, the southern Dutch Provinces and Austria. Charles V also acquired Spain from his mother, the Span-

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Figure 1. *Egbert van Heemskerck (1634-1704), The Surgeon Jacob Fransz Hercules With His Family at Work in His Shop, oil on canvas. 70 × 59 cm. Courtesy of the Amsterdam Historisch Museum, Amsterdam, the Netherlands. While the surgeon is performing a phlebotomy, the apprentice is barbering.*

ish princess Joanna of Castile. The northern Dutch Provinces were forced to acknowledge Charles V.

During the 1460s, the surgeons were organized by the town councils into guilds whose membership also was open to women. Passing the master's examination, which assessed one's capability to perform phlebotomy and to manufacture and sharpen lancets, was mandatory to become a member of the guild. Joining a guild was obligatory when one intended to practice surgery, which included hairdressing and barbering. Initially, phlebotomy was the main surgical skill that the town-surgeons were required to master; however, the barber work prevailed in the practice of these medieval surgeons. During the 16th century, trephination of the skull and knowledge of fractures, dislocations, wounds, growths, and ulcers were added to the armamentarium of the surgeon-barbers.

During the 16th century, the son and heir of Charles V, Philip II, strove for an integration of the Low Countries and the Spanish-Hapsburg monarchy. Stadtholders were appointed for each province. William of Orange became the stadtholder of Holland, Zeeland, and Utrecht. The Protestants in this region were oppressed by the Catholic Spanish troops. Philip II responded to the iconoclastic fury in 1566 by sending a strong army to the Netherlands, commanded by the Duke of Alva, who installed a ruthless regime. The rebellious Dutchmen were led by William of Orange. In 1572, these Dutch Sea Beggars captured Brielle in Zeeland and some other cities. A long war between the Dutch and the Spanish troops followed. In 1574, Alkmaar and Leyden were besieged by the Spanish but withstood despite many deaths due to starvation. Be-



Figure 2. *Rembrandt van Rijn (1606-1669), The Anatomy Lesson of Dr Nicolaes Tulp, oil on canvas. 169.5 × 216.5 cm. Courtesy of the Mauritshuis, The Hague, the Netherlands.*

cause of this, Leyden was rewarded with the first university (including a medical school) in the Netherlands in 1575.¹ The Republic of Seven Provinces was then formed. In 1648, the war with the Spanish ended, and each Province was permitted to have one university. Amsterdam could not have a university because the province of Holland already had its university in Leyden. Therefore, the Athenaeum Illustre was founded in Amsterdam.

During the 17th century, women were no longer permitted to join the guilds. Religion was another cause of exclusion; only surgeons who belonged to the Reformed Church were eligible for guild membership. Catholics were not accepted. In the countryside, guilds did not exist. Often surgeons trained to work on ships, who had completed a training period of only 2 years, practiced in the rural areas. The guilds in the cities had their own surgeon's halls, which contained the surgical instruments and library. Apprenticeship in surgery lasted 4 to 5 years. The apprentice was required to pay the tuition during the first years of his training. During the surgeon's training, barbering and domestic duties consumed most of the time of the apprentice before phlebotomy and trephination of the skull became part of the surgeon's role (**Figure 1**).

During the 17th century, the importance of anatomy was acknowledged at the universities of medicine and in the practical surgical training. In Leyden in 1593, Professor Pieter Pauw built an anatomical theater with 6 galleries holding 400 spectators. The anatomical demonstrations were open to the public on payment of an admission fee. Rembrandt painted an anatomical demonstration by Dr Nicolaes Tulp which is known as the *Anatomy Lesson* (**Figure 2**).

Hospitals have existed in the Netherlands since the 12th century. These hospitals usually were referred to as "guesthouses," since they acted simultaneously as almshouses, nursing homes, and orphanages. The surgeons were subordinate to the physicians who supervised the hospitals. During 1554, the first operation was performed at a hospital in the Netherlands. With the permission of the town authorities, several toes were amputated by 3 master surgeons in the presence of 2 medical doctors at a hospital in Amsterdam.

The Seven Provinces of the Netherlands were weakened severely by their consecutive wars with the Spanish. Four Anglo-Dutch naval wars left the Provinces in dire straits, and the armies of the French Revolution took over the country in 1795. The Batavian Republic was declared as a unified state with a central government in The Hague.

EIGHTEENTH-CENTURY surgery in the Netherlands is considered the French period. A small number of Dutch surgeons observed the work of French surgeons and paid steep fees. After their study period in France, they adopted the title “French master.” During the 18th century, the training of surgeons by the guilds changed little. Surgeons, however, attempted to acquire university doctorates to attain equal footing with physicians (ie, internists). The public discriminated a clear difference in status between physicians and surgeons; the physicians usually were categorized in the upper class, while the surgeons were categorized in the lower middle class.¹

Major operations were rarely performed during the 1700s. In Amsterdam, which had a population of around 200 000 people at that time, not more than 4 lithotomies per year were performed, while a herniotomy to relieve a strangulated hernia or amputation of a leg was even more scarce.

The Netherlands were annexed by Napoleon to the French Empire in 1810. Although the trading opportunities for the Dutch became scarce, some French measures were to the advantage of the Netherlands. Registries of births, marriages, and deaths and cowpox vaccinations were introduced. The French degraded the universities of Utrecht, Franeker, and Harderwijk to *écoles secondaires*, while Leyden and Groningen were designated as *Académies de l'Université Impériale*. The government effected its first medical constitution in the history of the Netherlands. Enrollees in university medical education were divided into 3 groups: doctors of medicine, doctors of surgery, and doctors of obstetrics. The government also divided surgeons into city surgeons, country surgeons, and obstetricians.

During the early 1800s, the surgical guilds started to crumble. In Amsterdam, the municipal government installed the Committee of Medical Supervision to replace the guild administration, which was known as the *Collegium Chirurgicum*. Barbering was separated from surgery in most cities.

During 1813, Napoleon was defeated in Leipzig by Austria, Russia, Prussia, and Sweden. Upon liberation from the French, a monarchical form of government was initiated in the Netherlands. In 1828, training schools for surgeons, known as “clinical schools,” were established in several cities in the Netherlands. These clinical schools were linked to hospitals and funded by the municipalities. The candidates for the clinical schools were expected to be able to read and write and to have some knowledge of Latin. The training for city surgeons and country surgeons was of 4 years’ duration.

During the 19th century, which was marked by the technological development of new power sources and epidemics of smallpox, scarlet fever, and cholera through-

out Europe, major changes occurred in surgery. Until the 19th century, pain during operations could be limited only by operating at high speed with razor-sharp instruments. The American invention of anesthesia was of paramount importance for the development of surgery. Horace Wells, a dentist in Hartford, Conn, discovered the anesthetic value of laughing gas in 1844, and William Morton, Boston, Mass, succeeded in inducing general anesthesia with the inhalation of ether in 1846.² These developments rapidly spread to Europe. In 1847, the first operation under general anesthesia in the Netherlands was performed in The Hague.

In 1852, the Dutch military surgeon, Mathijssen, invented the modern plaster bandage to immobilize fractures. Antisepsis was, in addition to anesthesia, the other revolutionary change in surgery. Inspired by the fundamental research of the French chemist Louis Pasteur, who showed that unicellular microorganisms caused putrefaction, Joseph Lister (a professor of surgery in Glasgow, Scotland) used carbolic acid for the disinfection of wounds, surgical instruments, and surgeons’ hands.² The use of antisepsis was first used in the Netherlands in 1874.

During the second half of the 19th century, Germany became an important power owing to its high degree of industrialization. Germany also expanded its scientific knowledge. Training in surgery and surgical practices in Germany were organized in a very disciplined manner. German medical textbooks were progressively used in the Netherlands. Dutch surgeons visited the meetings of the German surgical association, the *Deutsche Gesellschaft für Chirurgie*. Chairs at various Dutch universities were held at the turn of the 19th century by Germans, Austrians, and the Swiss. Among them were pupils of the famous Theodor Billroth from Vienna, Austria, and Theodor Kocher from Bern, Switzerland.

Performing major operations remained rare during the 19th century. In 1891, the first herniotomy for a non-strangulated hernia was performed in Utrecht. Appendectomy and other abdominal operations were performed later. Otto Lanz, who was a pupil of Kocher from Bern, introduced thyroid surgery in the Netherlands in 1902. During that same year, the Dutch Surgical Society was founded.

During 1865, the Dutch government ended surgical training outside the universities. However, specialization in surgery was not structured. Candidates would serve as assistants at a hospital in the Netherlands or abroad for a self-determined term. Gynecology and surgery were frequently combined as a double specialty. Until 1931, all physicians had the right to perform surgical procedures.

During 1930, the Dutch Medical Association, which was formed in 1849, decided to start registering specialists. The duration required for the surgeon’s training was established at 3 years. This remained the required period until 1948.

The occupation of the Netherlands by the Germans during World War II interfered greatly with the education at the universities, since only those who supported the German regime could attend the university. Medical research was performed in secrecy during the war. During 1942, however, Willem Johan Kolff de-

signed an artificial kidney for extracorporeal dialysis. In Nijmegen, which was in the front line of battle in 1944 and 1945, the intramedullary Küntscher nail was used for the first time in the Netherlands to treat femoral fractures. In 1948, the Dutch Surgical Society established a council from among its members, the *Concilium Chirurgicum*. Today, the *Concilium Chirurgicum*, in Utrecht, still delineates the training requirements and supervises the training at the teaching hospitals. In 1948, this council extended the surgical specialty training from 3 to 6 years. During the 1950s, thoracic and vascular surgery were first performed. In 1961, the first kidney from a living donor was successfully transplanted. In 1979, the first liver transplantation was performed in Groningen, while the first heart was transplanted in 1984 in Rotterdam.

MEDICAL SCHOOLS

The 8 medical schools in the Netherlands are located in Amsterdam (2 schools), Groningen, Leyden, Maastricht, Nijmegen, Rotterdam, and Utrecht. Yearly, approximately 1600 candidates start medical school. The selection of candidates for medical school is determined by chance and by the mean grade of the final examinations at high school. More than 60% of all Dutch medical students are women. The annual tuition for medical school is only \$1000 (US dollars) owing to vast governmental subsidies. The medical curriculum is a 6-year program divided into 2 phases: a first phase of 4 years and a second phase of 2 years. The education during the first phase is moving away from teaching large groups of students toward the interactive teaching of small groups of students. Medical problem solving and integration of courses have become the priorities instead of acquisition of medical knowledge.³

On completion of the first phase, the master's degree is acquired. The second phase is solely practical, involving rotations in almost all medical specialties. At the end of the second phase, the medical doctor degree is awarded.

SURGICAL TRAINING

In the Netherlands, training in general surgery requires 6 years. Candidates applying for the training in general surgery should have completed medical school. Foreign medical graduates from countries in the European community also are permitted to apply for surgical training in the Netherlands. However, command of the Dutch language is a prerequisite. The number of applicants has been relatively constant during the last few years, averaging around 220 per year. The proportion of female applicants is increasing. In 1998, one third of the candidates were women.

The surgical training in the Netherlands is organized into 8 regions. Each region consists of 1 university hospital and 4 or 5 affiliated community hospitals. The candidates may indicate 3 regions of preference, and the assignment is made based on these preferences. In each region, a regional training committee, with the directors of surgical training of the hospitals as members, selects and interviews residents. In some regions, a

surgical resident is a member of the regional training committee. The number of residents permitted to start the training in general surgery is determined every year, based on the expected number of retiring surgeons and the expected greater demand for surgical care owing to the aging population, by the Central Admittance Committee, which is appointed by the Dutch Surgical Society to supervise the selection of surgical residents. Limiting the inflow of surgical residents was started in 1980 when the number of recently qualified surgeons without a permanent position increased steadily.⁴ Yearly questionnaires among surgeons who have just completed the training assess the current employment market. At present, the market for surgeons seems to be in balance in the Netherlands.

The surgical training in the Netherlands usually takes place within 1 region. Surgical residents are trained at the university hospital and at the community hospitals. Most of them spend 3 years at a community hospital and 3 years at a university hospital, although other schedules are also possible. Half a year of the 6-year curriculum may be devoted to research in the Netherlands or abroad. The training schedule is determined by the individual regions. The Dutch Surgical Society has set 600 as the minimum number of operations that a surgical resident should have performed by the end of the training period. To ensure a good balance between simple and complex surgical procedures, the procedures have been divided into 7 categories. For instance, repair of an umbilical hernia is considered category I, while total thyroidectomy is considered category VI. Category I operations are appropriate for the first-year resident, category II for the second-year resident, and so on. Category VII, which includes procedures such as renal transplantation, is intended for surgeons in a fellowship who are "superspecializing." However, the categories are not used rigidly. The distribution of the 600 operations within the categories should be as follows: I through III, 375; IV, 125; V, 75; and VI and VII, 25.

During the training, the surgical resident rotates through all divisions of general surgery. In some regions, specific rotations at a pediatric hospital and a cancer institute exist. Specific rotations through the departments of thoracic surgery, plastic and reconstructive surgery, urology, and orthopedic surgery are no longer part of the training. The majority of pulmonary surgery in the Netherlands is performed by general surgeons at community hospitals, so surgical residents may participate in pulmonary surgery during their period at the community hospitals. An official fellowship in pulmonary surgery is available for general surgeons. The Netherlands is one of the few countries in which trauma care is provided by the general surgeon. During the training in general surgery in the Netherlands, the resident is trained to diagnose and treat almost the entire spectrum of fractures.

In the Netherlands, the departments of surgery display a high degree of unity despite various divisions. Most meetings are attended by all members of the department. The average day begins with a meeting of the entire department during which residents who have been on duty report clinical activities during the past night or

weekend. At the end of the afternoon, another general meeting takes place during which the operations of that day are reported. Furthermore, medical students or surgical residents present the medical cases of patients who have been scheduled for an operation the next day. Morbidity and mortality meetings are held weekly.

The surgical resident must pass 2 examinations in preoperative and postoperative care, intensive care, and oncology during the first 2 years of training. During the following 4 years, mandatory specialized courses on various topics are taught twice a year. These courses are organized by the Dutch Surgical Society. During the surgical training program, all residents attend the basic osteosynthesis course, based on the "Allgemeiner Osteosynthesis" principles from the Swiss school of fracture treatment, and an advanced trauma life support course. Surgical residents are assessed yearly by the director of surgical training. This assessment is discussed with the resident. A resident deemed unqualified for continuation or completion of the residency can be transferred to another hospital for a second assessment. There is no final examination at the end of the surgical training.

An important recent change in surgical training in the Netherlands is the regulation of the working hours of residents. During the early 1990s, Dutch surgical residents worked between 80 and 100 hours per week. The government determined that the long working hours compromised the quality of health care and the well-being of residents, and it intervened. Within a few years, the working hours of residents were reduced to 48 hours per week. In addition, strict rules indicate the number of consecutive hours that a resident is permitted to work. Although the basic principles of limiting working hours are admirable, the extent of the reduction of hours has met great opposition in the medical field. However, a law has been passed obligating hospitals to follow the regulations, and violation results in steep fines. Surprisingly, the working hours of specialists have not been subjected to governmental intervention. The consequences of the reduced work week are far reaching. Continuity of patient care is deregulated, attendance at meetings of the department of surgery is fragmented, and, foremost, the available time for training has become less. Considering this fact and the increasing specialization in various fields of surgery, the format of the training in general surgery will be adjusted. In 1999, the sixth year of residency will be designated the "differentiation year." Four differentiations are possible: surgical oncology, gastrointestinal tract surgery, vascular surgery, and trauma care. The future will show whether the quality of the surgical training suffers owing to the reduced working hours.

During the 1950s, about 75% of the population had medical care that was subsidized by the government ("sickness funds").⁵ Considering the major role of the government in health care, an organization for training in specialties was founded in 1961 that comprised specialists, government representatives, and hospital representatives. The Central Board, with medical representatives from university and nonuniversity hospitals, representatives from hospital associations, and representatives of

the Ministry of Education and the Ministry of Public Health, determines the institution of new specialties and establishes the requirements for trainers, training institutions, and residents. The Committee for Specialist Registration, with members from all recognized specialties and hospital associations, implements the decisions of the Central Board. The Committee for Specialist Registration grants permits to teachers and training centers and oversees their inspection by committees of inspectors, who are recruited from the councils of the specialist associations. Training hospitals are inspected at least every 5 years. If the conditions established by the Central Board are not met, a reinspection is ordered by the Committee for Specialist Registration after 2 years. The permit for training can be withdrawn at reinspection.

SURGICAL SOCIETIES AND RESEARCH

The Dutch Surgical Society has more than 1100 members. Within the Dutch Surgical Society are societies for vascular surgery, gastrointestinal tract surgery, surgical oncology, trauma care, pediatric surgery, thoracic surgery, endoscopic surgery, endocrine surgery, and tropical diseases. The Dutch Surgical Society organizes 2 meetings per year with free attendance at presentations of papers and invited lectures. The societies organize courses and workshops in addition to these meetings.

The Dutch Surgical Society publishes 2 official journals. The *Nederlands Tijdschrift voor Heelkunde* is a national journal of the society in the Dutch language. The *Netherlands Journal of Surgery* joined the *Acta Chirurgica Scandinavica* to form the *European Journal of Surgery*.

Research in surgery, both clinical and experimental, is performed extensively in the Netherlands. Clinical research has focused in the past on randomized clinical trials. Such trials are feasible in the Netherlands since Dutch patients, by choice, do not have an outspoken opinion about the kind of treatment they desire when they visit the medical specialist. Cooperation with the Scandinavian countries in randomized trials is frequently sought because of their many similarities with the Netherlands in the outlook toward and the organization of health care. Follow-up in the Netherlands is feasible since traveling time is limited by the size of the country. Another advantage for follow-up studies is the registration of all citizens, which facilitates the tracking of patients. All hospitals have medical ethics committees that assess the clinical value, statistical methods, and ethical aspects of clinical trials.

Experimental research is concentrated at the university hospitals. Most university hospitals have facilities for experimental animal work. Research with experimental animals is bound by strict regulations. Researchers are required to complete a course on animal handling and ethics before they are permitted to work with experimental animals. Experimental research projects must be approved by animal ethics committees.

Funding for research is provided by governmental subsidies, charity funds, or funds from the medical industry. The funding by the government has decreased during past years.

DISEASE PATTERNS AND THEIR INFLUENCE ON SURGICAL PRACTICE

The Netherlands has the highest population density of all European countries. Every square kilometer has a mean population of 442. Owing to a high birth rate during the 1950s and 1960s, the proportion of inhabitants 65 years or older is only 13%. However, the population is aging, with an annual increase of 1.3% in the group older than 65 years.⁶ Of the Dutch population, 4.8% are not of the Dutch nationality. The majority of these are Turkish or Moroccan. Another 4.7% was not born in the Netherlands but acquired the Dutch nationality. Most originate from former Dutch colonies, such as Indonesia, Suriname, and the Dutch Antilles.

Cardiovascular disease accounts for 38% of mortality in the Netherlands.⁷ Ischemic heart disease and cerebrovascular disease are the most common cardiovascular events. Malignant tumors are the second major cause of death (30%).⁶ In men, 25% of deaths are due to lung cancer, while prostate cancer (14%) and colorectal cancer (12%) are other common causes of death. In women, breast cancer is the most frequent cause of death (32%). Colorectal cancer (14%), lung cancer (5%), endometrial cancer (5%), and ovarian cancer (5%) are other frequent malignant tumors in Dutch women.

Mortality due to traffic accidents decreased greatly after the introduction of maximum speed limits, safety belts, crash barriers, and mandatory helmet use for motorcyclists and moped riders during the 1970s. The annual mortality due to traffic accidents decreased from 3181 in 1970 to 1334 in 1995.⁸ Considering the growth of the population and the increase in the number of vehicles during this period, the value of safety measures in traffic is evident. Of the 1334 traffic casualties in 1995, 267 were cyclists, and 118 were moped riders. Bicycles and mopeds are commonly used for transportation in the Netherlands.

The acquired immunodeficiency syndrome was the cause of death of 418 people in 1990. In 1996, this number had decreased to 208.⁹

The total annual number of operations in the Netherlands has remained relatively constant during the last few years.¹⁰ An average of 225 000 operations is performed per year. Repair of hernias (13%), venous and arterial procedures (12.3%), operative treatment of fractures (9%), breast surgery (8%), and gallbladder surgery (8%) are the most common in the Dutch surgical practice.

Endoscopic techniques were introduced into Dutch surgical practice in 1990.¹¹ In 1995, 70% of all cholecystectomies were performed laparoscopically, as were 50% of all antireflux operations (Nissen funduplications) and 13% of all inguinal hernia repairs.¹²

HEALTH CARE PROVISION

Dutch citizens have equal access to health care in the Netherlands. Dutch legislation requires that every citizen have health insurance. Of the population, 63% is covered by sickness funds,⁹ a type of health insurance that is subsidized by the government. The remaining 37% of the Dutch

population is insured by private companies. The annual salary of a person determines the eligibility for sickness funds or private insurance. Almost 9% of the gross national product was spent on health care in the Netherlands in 1995.⁹

General practitioners have a vital role in Dutch health care. When ill, the patient must first consult the general practitioner. If the general practitioner determines that referral to a medical specialist is indicated, the patient is referred to a hospital. Direct consultation of a medical specialist by a citizen is impossible except for the treatment of traumatic lesions, for which patients are permitted to visit the emergency room of a hospital within 24 hours of the injury. The government designates general practitioners as the gatekeepers in health care to limit costs.

Before 1983, hospitals were financed based on their production output,¹³ and the costs of health care had increased steadily during previous decades. In 1983, to control the costs of health care, the Dutch government introduced hospital budgeting. A global budget based on previous years was calculated for each hospital. If expenses exceeded the budget by 5% or more without an evident explanation, the budget was decreased the following year. This measure has stimulated growth of outpatient care. In 1985, only 204 000 outpatient admissions were registered; this number more than tripled, to 644 000, in 1995.⁹ The mean length of hospital stay has decreased gradually from 18 days in 1970 to 10 days in 1995. Another important change in medical finances is the recent change in the rates for medical care. Until 1997, different rates existed for patients with sickness funds than for those with private insurance. In 1997, the rates were equalized. The rates for surgical procedures are determined by a national committee composed of representatives of the government, health care insurance companies, and hospitals. Medical specialists are not permitted to set their own rates.

In an attempt to limit the costs of health care and increase the effectiveness of hospitals, the Dutch government has closed more than 25% of the hospitals in the Netherlands since 1985.⁹ At present, 148 hospitals remain. The number of hospital beds decreased from 68 461 in 1985 to 60 489 in 1995.⁹

The number of nursing staff has been reduced, and the working hours have been reduced to 36 hours per week. At present, particularly in the western part of the Netherlands, there is a shortage of operative nurses and anesthesiology nurses. Low salaries, limited career prospects, and inadequate opportunities for part-time jobs seem to be the causative factors.

The aforementioned developments have resulted in growing waiting lists for medical procedures. The waiting time for orthopedic procedures and eye surgery at many hospitals exceeds 1 year. General surgical procedures, such as inguinal hernia repair and laparoscopic cholecystectomy, also face these waiting times, particularly at the university hospitals. Local collaboration projects between hospitals and large companies to guarantee short waiting times for the employees of the companies have been initiated. However, the Ministry of Health is opposed to such arrangements because they

could conflict with the principle of equal access to health care for all Dutch citizens.

THE FUTURE

The future of surgery in the Netherlands harbors several uncertainties. The first uncertainty is the extent to which surgery can remain a general profession. Initiatives to isolate vascular surgery, trauma surgery, and other subspecialties are commonplace. The increasing complexity of specific procedures and the growing quest of patients for quality care will make general surgeons a rare species. The second uncertainty is the quality of care. Considering the reduced income of surgeons, it is likely that surgeons will limit their work week according to the working hours that have been implemented for the majority of the Dutch working population. This will undoubtedly affect the care for the patient. Another uncertainty is whether the quality of surgical training will deteriorate owing to the decreased number of work hours. What will be the role of women in surgery? Will female surgeons outnumber male surgeons in several years? Will surgery become a part-time job? Will private hospitals have an important role in health care in the near future? Time will answer these questions.

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Impact of Major Cardiovascular Disease Risk Factors, Particularly in Combination, on 22-Year Mortality in Women and Men

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Background: The appropriateness of current cardiovascular disease (CVD) risk factor guidelines in women continues to be debated.

Objective: To present new data on the appropriateness of current CVD risk factor guidelines, for women and men, from long-term follow-up of a large population sample.

Methods: Cardiovascular disease risk factor status according to current clinical guidelines and long-term impact on mortality were determined in 8686 women and 10 503 men aged 40 to 64 years at baseline from the Chicago Heart Association Detection Project in Industry; average follow-up was 22 years.

Results: At baseline, only 6.6% of women and 4.8% of men had desirable levels for all 3 major risk factors (cholesterol level, <5.20 mmol/L [<200 mg/dL]; systolic and diastolic blood pressure, <120 and <80 mm Hg, respectively; and nonsmoking). With control for age, race, and other risk factors, each major risk factor considered separately was associated with increased risk of death for women and men. In analyses of combinations of major risk factors, risk increased with number of risk factors. Relative risks (RRs) associated with any 2 or all 3 risk factors were similar: for coronary heart disease mortality in women, RR = 5.72 (95% confidence interval [CI], 2.35-13.93), and in men, RR = 5.51 (95% CI, 3.10-9.77); for CVD mortality in women, RR = 4.54 (95% CI, 2.33-8.84), and in men, RR = 4.12 (95% CI, 2.56-6.37); and for all-cause mortality in women, RR = 2.34 (95% CI, 1.73-3.15), and in men, RR = 3.20 (95% CI, 2.47-4.14). Absolute excess risks were high in women and men with any 2 or all 3 major risk factors.

Conclusions: Combinations of major CVD risk factors place women and men at high relative, absolute, and absolute excess risk of coronary heart disease, CVD, and all-cause mortality. These findings support the value of (1) measurement of major CVD risk factors, especially in combination, for assessing long-term mortality risk and (2) current advice to match treatment intensity to the level of CVD risk in both women and men. (1998;158:2007-2014)

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