

Surgical Training in the Netherlands

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Abstract Surgical training in the Netherlands has traditionally been characterized by learning on the job under the classic master-trainee doctrine. Over the past decades, it has become regionally organized with intensive structural training courses, and a peer-based quality control system. Recently, the nationwide programme has been modernized further and now involves a systematic, competency-based education with structural training courses, formalized assessment and room for reflection by residents under the supervision of surgical teaching groups. To this end, a uniform web-based digital portfolio is being introduced to facilitate monitoring of the individual resident's progress. Though requiring inspirational leadership, commitment, and determination, this modernization has sparked enthusiasm among trainees and teachers.

Introduction

Surgical training in the Netherlands has evolved over the past decades from the traditional learning on the job under the classic master-trainee doctrine to a systematic,

competency-based program with structured training courses, formalized assessment, and room for reflection by residents under the supervision of surgical teaching groups. This process has been governed by medical, educational, and societal developments. Despite many hurdles yet to be met, it is becoming increasingly clear that the new approach, including web-based digital portfolio technology, inspires both trainees and teachers.

Historical perspective

In the early 1970s surgical residency was characterized by individualism. Program directors had a rather high degree of autonomy, selection of new residents was based on personal preference, and residents were trained in one hospital under the supervision of one program director. The director was the role-model and the residents clearly identified themselves both with his and their training hospital's doctrine during the 6 years of surgical training. Tailoring of the number of residents accepted in the program (the influx) to the nationwide need for surgeons (the market) did not exist, and there were no national courses, structured education, or board exams. Nonetheless, surgical residents were generally well trained thanks to highly motivated program directors. They were exposed to a fairly large number of operative procedures, although the degree to which they could perform these procedures themselves differed vastly between programs, i.e., hospitals. However, they were all able to comply with the fixed minimum number of procedures as primary surgeon, with a certain variety in the type of procedures. In addition, a system of inspection tours of residency-training programs by designated surgeons (all program directors themselves) became operational to ensure quality control.

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By the mid-1980s central (national) board exams on basic surgical topics such as surgical anatomy, perioperative care, and wound healing had become mandatory for first- and second-year residents. At that time two developments were to have a dramatic impact on the evolution of surgical training in the Netherlands. First, the influx of new residents had greatly overshot the market and some 50 young surgeons who had just finished general surgical training were seeking employment. This led to an abrupt nationwide discontinuation of the program so that no new residents were allowed to enter the program during 1983 and 1984. Furthermore, temporary positions for young surgeons, including extended training, advanced speciality training, and “chef-de-clinique” positions, became increasingly popular. However, more importantly, the organization of the selection and placement process of new residents was revised and centralized with the aim of adjusting the inflow of new surgeons to the number of vacancies expected. Selection was organized by the Association of Surgeons of the Netherlands and included a standard questionnaire, psychological testing, and an interview with a national panel of program directors. In addition, the organizational structure of the surgical residency program was modernized. While selection and admittance were done on a national level, the programs were now organized regionally. Eight regions were formed consisting of a university hospital and several nonacademic teaching hospitals grouped together. As a consequence, each resident would spend part (2–3 years) of his/her training in the university hospital, and part (3–4 years) in one of the teaching hospitals of a particular region. Residents were now exposed to at least two visions of performing surgery.

The second issue that has dominated the evolution of surgical training was the initiation of the debate on working hours by residents of all specialities. In 1993 this resulted in a legislative governmental decision, the Working Hours Act, that restricts working hours for all residents in training to 48 h a week, including theoretical courses and skills-lab training [1]. This has obviously had a great impact on the organization of surgical residency programs in our country. In particular, regional training courses, skills-lab sessions, and national teaching and examination were designed to counterbalance the increasing discontinuity on the work-floor [2]. Similar consequences have been reported from other countries as well [3, 4]. And despite growing concerns that the limitation of working hours would lead to diminished operative experience for the residents, this has not been substantiated when researched [5, 6]. Nonetheless, the surgical program directors are confronted with an enormous challenge to meet the increasing requirements of continuity and quality in daily patient care while ensuring modern, high-quality training for residents who are not

continuously available, including a sufficient number of operations performed as primary surgeon.

Current situation: the role of the regions

The Dutch surgical residency program has very much become a regional effort. By the mid-1990s the national selection process was simplified and the central psychological testing omitted. Presently, only the determination of the number of new residents to be admitted yearly takes place at the national level, together with the coordination and registration. The actual selection is done regionally. Applicants may indicate two preferred regions and fill out a short questionnaire and curriculum vitae form. The eight regional program committees (consisting of all regional program directors, a resident-representative, and the regional university program director who generally presides) jointly interview and select candidates. The residency still takes 6 years, during which the resident spends 2 (or 3) years in the university hospital and 4 (or 3) years in one of the peripheral teaching hospitals of a particular region (in either order). The first 2 years involve basic surgical training. Although under some debate, this same trajectory is currently followed by first and second year residents in orthopedic surgery, plastic surgery, and urology as well and is hence named common trunk. These common trunk residents all follow the same training in the general surgery department under the supervision and responsibility of the surgical residency program director. During the first 2 years the residents follow a series of *regionally* organized courses and tutorials, including basic surgical skills, basic laparoscopy, surgical anatomy series, evidence-based medicine, intensive/perioperative care, communication, and Advanced Trauma and Life Support, all of which conclude with an assessment. In addition, they have to pass one formal (national) examination in this stage.

The general surgery residents then enter the second phase of advanced/continued surgical training. This phase includes 3 years of general surgery and a final differentiation year. They generally switch hospitals once (from academic to peripheral or vice versa) as described above, but they remain in the same region. They follow a series of regional courses as well as two 2-day national surgical courses yearly throughout their continued education. There is no formal board examination at the end of the 6-year residency. During the final differentiation year, the residents have to choose one of the major surgical specialities: surgical oncology, gastrointestinal surgery, trauma surgery, or vascular surgery. More recently, criteria and endpoints have also been defined for pediatric surgery and pulmonary surgery, although these have yet to pass legislation. During

the differentiation year emphasis is put on a multidisciplinary approach, including discussions on indications for surgery (or other treatment options). The resident has to play a visible role during these meetings. He or she has the opportunity to get acquainted with several advanced procedures within the field of interest. Upon completion of the program after 6 years, the program director proposes the resident for registration as a surgeon to the Medical Specialists Registration Committee, which has to formally endorse this proposal. At this time, the resident has to put forward a list of all courses and exams that were attended, a minimum of one presentation at a(n) (inter)national congress, and one publication in a peer-reviewed journal. Also, he/she has to hand in a list of all surgical procedures performed both under supervision and independently. By legislation, a resident must have performed at least 150 operations in the first 2 years, and a minimum of 400 procedures as primary surgeon during the final 4 years, including 350 more complex cases. All procedures are classified according to their degree of complexity, and the resident has to hand over a list of procedures performed according to this classification as well.

Evaluation

All programs and program directors are obliged by law to undergo regular peer-organized and peer-conducted quality control checks at least once every 5 years. The Concilium Chirurgicum is the body of the Association of Surgeons of the Netherlands that is responsible for the organization and modernization of the surgical residency program and for its quality control. Members of the Concilium include all academic program directors, representatives from the regional teaching hospitals, delegates from the Association of Surgical Residents of the Netherlands, and delegates from the surgical subspecialties. A delegation of four Concilium members, including a resident-representative, performs a site visit, interviewing the surgical team and the residents and the hospital board on a variety of topics concerning the program. Furthermore, they have at their disposal a preformatted standard report, filled out by the program director, regarding local educational programming, working schedules, regular evaluations between each resident and the director, numbers of new patients seen/admitted, and lists of operations and interventions performed by each individual resident and by the entire surgical team. The visitation committee files a site-visit report, including points of strength and issues that require attention or improvement, which is then discussed and formally approved by the Medical Specialists Registration Committee. Usually this leads to minor or major adjustments, but in some instances a negative judgment has

indeed resulted in stopping the training program in a particular hospital. This system of quality control has proven robust, although the criteria on which the judgment is based warrant further refinement and clarification.

On a separate note, the residents' association conducts its own evaluation by means of a yearly survey among its members. Although without formal (legal) consequences, these evaluations are so informative that they are publicly discussed each year during one of the Concilium meetings. The results of the most recent survey will be published in this journal [7]. Overall, Dutch surgical residents appear to be satisfied with their training. They conduct, on average, a working week of approximately 55 h (including study), perform approximately 200 operations per year per person (stable for the past 7 years), and are happy with the final differentiation year, although most desire further postresidency subspecialization. They view the supervision by the entire surgical group involved in their program as quite satisfactory (7.5 on a scale of 10). Also, they appreciate the quality and the increasing amount of time that is being reserved for courses and tutorials. Ideally, both female and male residents would want to work approximately 50 h in a 4-day week once they have completed their training [7].

An issue that is deemed undesirable by both surgeons and residents is the delay that medical students experience between graduation from medical school and their entry into a residency program in surgery. On average this gap amounts to 2.5 years! Although many candidates spend this time usefully by pursuing scientific research and/or completing a PhD thesis or by gaining experience as a medical officer on a surgical ward, this cannot conceal the unwanted discontinuity in medical education. Some universities (medical schools) have already adapted their medical teaching schedules and programs to allow the student more exposure to the medical departments at a much earlier stage than traditionally. In particular, students spend a large part of their final year in the department of their choice. This may help to lower the threshold, bringing together student and speciality at an earlier stage, allowing students to show their skills and motivation and to take part in surgical research throughout their studies. When redesigning the surgical training program (see below), attention should also be given to this aspect in an attempt to reduce the gap between medical school and specialization in surgery.

Modernization

In spite of the high level of training and monitoring already attained, several aspects of the current curriculum clearly need improvement. First, the criteria for appraisal and assessment of both the resident and the surgical trainers

need to be explicitly defined and clarified. Softer criteria such as behavior and professionalism should be incorporated in the assessment. Second, methods of focused assessment have to be standardized and formalized. Finally, there should be more room for reflection, specific feedback, and regular monitoring of the residents' individual performance. Such improvements could also facilitate peer-conducted quality control and allow for better connection of young specialists-in-training with today's demands regarding healthcare of patients and society. These considerations have recently prompted our Minister of Health to demand a modernized, competency-based training plan for all 27 recognized medical specialties of the Central College of Medical Specialities. The surgical community in the Netherlands has mandated a group of 22 surgeons and residents, representing approximately half of the training hospitals in the country and including two experts in teaching and education, to write such a plan. This task was completed by May 2007 and the entire surgical training program has been redefined on the basis of the CanMEDS competences. The entire program is described in surgical themes, of which 47 have been defined. Examples are the acute abdomen, injury of the extremities, perioperative/intensive care, surgical

infections, breast tumor, and cerebrovascular pathology. The content of each theme is described on one page along the lines of the seven competences as defined in the CanMEDS (Table 1). Under the competence "medical expert," each theme is delineated in four sections: (1) pathophysiology and etiology, (2) diagnostics, (3) treatment plan, and (4) the according (operative) skills that should be mastered within the theme. The desired level of expertise/knowledge is indicated on a scale from A to E (A = knows, E = supervises) for the various stages of training (basic = first 2 years, advanced = years 3–5, differentiated surgeon = year 6, and postresidency subspecialization = year 8). This greatly enhances the flexibility of the program so that future adjustments, e.g., earlier differentiation, or subspecialization within the 6 years, may be implemented easily. With regard to surgical skills, a list of key procedures is included in the plan. These are the procedures that should be mastered at a certain level (and with a certain level of experience, i.e., number performed) depending on the year of training.

Assessment is outlined on the second page of each surgical theme (Table 2). First, several typical clinical presentations are indicated that may be used for assessment in the context of the theme with special attention for the

Table 1 Description page surgical theme: breast tumor

Competence		1–2	3–5	6	7–8
Medical expert/clinical decision-maker	Pathophysiology and etiology				
	Knowledge of basic tumor biology and of the various forms of breast cancer	C	D	E	
	Diagnostics				
	Value of mammography, ultrasonography, MRI, cytology, histologic biopsy, including clinical application	C	C	D	E
	Treatment plan				
	Indication for all types of surgical treatment	B	D	E	
	(Neo)adjuvant treatment tailored to the individual	B	C	D	E
Skills	View list key procedures				
	Recognizing possible complications and their treatment	C	D	E	
Communicator	Patient intake and instructions about treatment (plan)				
	Delivery of bad news				
Scholar					
Collaborator	Functioning adequately within the context of a breast team, including breast care nurses, nurse practitioners, etc.				
Manager	Logistics breast teams/units				
	Comprehensive cancer centers				
Health Advocate	Organization of breast cancer patients				
	Recovery and balance programs				
	Chronic fatigue				
	Screening				
Professional	Hereditary issues				
	Dealing with fear of death				

Table 2 Assessment page surgical theme: breast tumor*Typical clinical situations*

- Patient with lump in breast (including full instruction and explanation of diagnostic and therapeutic process and considerations)
- Delivery of bad news

Competences that may be assessed specifically in this theme (besides medical expertise)

- Communication
- Collaboration
- Management
- Health advocate

Knowledge

- Etiology, diagnostics
- Surgical, radiotherapeutic, hormonal, and cytostatic treatment options
- Guidelines in the Netherlands on the treatment of breast cancer

Literature

- Book referral: Chapters on breast cancer and (neo)adjuvant therapy in Van de Velde CJH, et al. *Oncology* (ISBN 90-313-4177-0)
- Adjuvant online
- Dutch guidelines

Assessment: examination, course on breast cancer, short clinical assessment

Skills

- View list key procedures: lumpectomy, mastectomy, breast conserving therapy, axillary dissection, biopsy

Assessment: OSATS

Behavior

- Delivery of bad news
- Working within breast team
- Cooperation with other specialist
- Input in multidisciplinary meetings

Assessment: short clinical or 360° assessment

competences that lend themselves to assessment. Next, the instruments are described by which the resident's knowledge, skills, and behavior, relevant to the theme, may respectively be assessed. This division reflects the fact that the seven competences are essentially the integration of knowledge, skills, and behavior. The instruments for assessment include structured testing of operative skills, formal behavioral assessment tools, and knowledge tests (exams/courses).

Prerequisite for the successful implementation of this new program is the mandatory use of a uniform, digital, web-based (as opposed to hospital-based) portfolio. This is owned and managed by the resident and includes all aspects of the training program, including operations performed, tests taken, courses and conferences followed, and assessment. The portfolio will be a life-long instrument for monitoring the skills and competence of the surgeon.

Assessment forms should be uniform, standard, and easy to fill out digitally by the member of the surgical team conducting the assessment. Feedback may thus be given at regular intervals by the program director based on multiple assessments by various members of the surgical training team, thereby minimizing the risk of subjectivity. Hence, an essential part in the implementation of the plan is the professionalization of both surgeons/program directors and residents regarding their role in personal coaching and monitoring of the resident's progress. Training sessions are currently being set up throughout the country for this purpose. These may also help ensure broad support for this ambitious modernization of surgical training. This new approach to surgical training will ask for an enormous effort on the part of surgeons and residents. The implementation of the new training tools and assessment in daily practice will be challenging but will result in more clearly defined surgical portfolios.

Concluding remarks

Within the next 6–12 months, the Dutch training in surgery will be restyled as outlined. This will create an even safer and more open training environment of high quality, with emphasis on a competency-driven program, regular feedback using standard tools, stored in a uniform, resident-owned digital portfolio. It will formalize the role of all members of the surgical team, as well as that of the program director and of the resident him or herself. Also, it will further underline the position of the surgeon as a team player. The government has implemented regulation for financing surgical training. However, not all financial issues of the medical specialty training program are resolved. The increasing influence of the government on financial aspects of medical specialty training will undoubtedly have profound effects, among others on the control of influx of new residents. The content of training is a definite matter of the professionals, and the role of the Association of Surgeons of the Netherlands and its training committee (the Concilium, Utrecht, The Netherlands) in describing and conducting both the training and its quality control should be guarded with caution.

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