Surgery in Saudi Arabia

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Understanding surgical education in the kingdom of Saudi Arabia requires not only an overview of general and medical education, but also a brief discussion about the health care system in the country and key factors that can affect the development of surgical training.

THE BEGINNING

Formal education in Saudi Arabia began around the fourth decade of the 20th century. At first only men were taught. Before this, youngsters were taught to read and write Arabic scripts and to read the holy Koran, but there were no formal schools. Usually, there was only 1 teacher for a group of male, and later female, students who were at different levels. This teacher was usually called “Katib” or “Mu‘allem,” singular for “Kuttab,” “Katteeb,” or “Ma’almeah.” There were both male and female teachers in many areas in Saudi Arabia. Students also went to Bahrain and Egypt for schooling.

THE FIRST FORMAL SCHOOL

The first formal school for boys opened in 1937, while the first formal school for girls opened in 1961. The teachers in these newly established schools were from neighboring Arab countries; when girls’ schools opened, the wives of male teachers taught the girls. The early male graduates of these preliminary schools served in various government offices. Their female counterparts stayed at home in the beginning.

EFFECT OF IMPROVED ECONOMIC RESOURCES

The first scholarships awarded to nationals by the government of Saudi Arabia were for study in Egypt. As the economic resources of Saudi Arabia improved, young male graduates were sent further abroad. Scholarships were mainly given to top students from the graduating classes each academic year in Saudi Arabia. King Saud University, Riyadh, was the first university in Saudi Arabia. More universities opened later. In 1974, 18,966 students attended these universities, while in 1978, the number reached 36,112.

HEALTH CARE PROVISION

Health care in Saudi Arabia was provided by physicians from neighboring countries who had various backgrounds, levels of education, and training. Specialists were usually trained for 2 to 4 years. At that time, the financial resources of Saudi Arabia were not as vast as they are now. Currently, health care in Saudi Arabia is free for all citizens and residents. It covers emergency and elective care, including transplantations, dialysis, and cancer therapy. This is expensive and consumes much of the country’s economic and human resources. The first Saudi Arabian physician graduated in 1956. In 1970, there were 789 physicians in Saudi Arabia, and in 1996, 15,484.

UNDERGRADUATE MEDICAL EDUCATION

An entrance examination, which is very competitive, is required for admission into an undergraduate medical program. Undergraduate medical education is a
6-year course. It includes basic sciences, preclinical studies, and 2½ years of clinical rotation.

The first medical school in Saudi Arabia was at King Saud University. It opened in 1969 and accepted 35 students in its charter class. Although the staff were mainly from neighboring Arab and Islamic countries, English was the language of instruction. The second medical college was in King Abdul Aziz University, Jeddah. Currently, there are 5 medical colleges, which together accept about 450 students each year. The total number of medical students was 2461 in 1997; of these, almost one third were female. In the same year, there were 396 new medical graduates. Another source of Saudi physicians is the medical graduates from other countries, both Arab and non-Arab.

INTERNESHIP

A 12-month rotating internship is required before starting postgraduate training. It consists of 3 months of training each in internal medicine and surgery, 2 months each in pediatrics and obstetrics and gynecology, 1 month in family and community medicine, and 1 month in an elective field.

SURGERY EDUCATION

At the early phase of medical education in Saudi Arabia, a few graduates went abroad, mainly to Egypt, for specialization. The degree attained was at first a “Diploma,” which later became a “Master in Surgery.” Thereafter, scholarships to various countries were granted by the Saudi government. The first group of Saudi Arabian physicians who traveled to the United States for specialization in surgery did so in 1969. Many of this group are still active in surgical practice in Saudi Arabia.

It was easier for Saudi Arabian graduates to go to other countries in the Middle East and Europe for specialization, probably because there were fewer constraints on their acceptance into accredited programs. The United Kingdom topped that list until West Germany started to accept significant numbers of Saudi Arabian high school graduates to study medicine and, at a later stage, to continue their postgraduate training in various fields, including surgery.

KING FAISAL UNIVERSITY FELLOWSHIP

King Faisal University, Dammam, was the first university in Saudi Arabia to start locally based postgraduate programs. The general surgery program was among the first to accept trainees; in 1983 the program was structured to last 5½ years.

The program consisted of the following courses: Principles and Skills of Surgery Including Accidents and Trauma, Basic Sciences for Surgery and Allied Surgical Specialties, Anesthesiology and Critical Care, Principles of Orthopedic Surgery, Urology, Neurosurgery, Plastic Surgery, Thoracic and Vascular Surgery, and Pediatric Surgery. In addition, there was a course in research methodology followed by a dissertation. The last 2 years were devoted to the practice of general surgery.

FELLOWSHIP OF THE ROYAL COLLEGES

Around the same time, many of the Royal Colleges of Surgeons from England and Ireland started to offer preparatory courses toward the primary examination in their respective fellowships and toward the actual examination in Saudi Arabia. The first time the Royal College of Surgeons in Ireland conducted the final (second part) examination in Saudi Arabia was in 1985. It was held at King Faisal University.

ARAB BOARD OF SURGERY

In 1979, the Council of Health Ministers in the Arab countries formed the Arab Board of various medical specialties. The Arab Board of Surgery accepted the first batch for surgical training in 1982. Saudi Arabia was an active member in the Council, and many of its postgraduates joined this program.

This is a 5-year structured training program. The instruction languages are Arabic, English, or French. The resident spends the first year in general surgery. The second and third years are spent in rotations, 3 to 6 months each, in the following specialties: emergency medicine and trauma, neurosurgery, orthopedic surgery, urology, and vascular surgery.

Rotations are credited to trainees after satisfactory completion of the allocated time, passing a written examination at the end of the rotation, and presenting a completed logbook. The last 2 years are spent in general surgery as a senior resident. During this period, the resident should write a thesis supervised by a consultant surgeon who is assigned by the training department.

Once this process is completed, the resident sits for a written examination. He or she is allowed to sit for the clinical and oral components only after passing the written component. There are several examination centers in the Arab countries, including one in Saudi Arabia.

SAUDI COUNCIL FOR THE HEALTH SPECIALTIES

In 1993, a royal decree established the Saudi Council for the Health Specialties. This council gradually took over all aspects of all training programs in Saudi Arabia. The council, through various committees, inspects and accredits programs using criteria such as number of faculty, available beds, and number and distribution of operative procedures per annum. Other required criteria of training centers are a library, laboratory and radiology facilities, an intensive care unit(s), and an emergency department. It also conducts admission tests, training evaluations, and certifying examinations.

In addition, the council evaluates the actual implementation of ongoing programs to ensure that the requisite standards are being maintained. One component of this evaluation process is that the board interviews trainees individually and collectively regarding program implementation from the trainees’ point of view.

The Saudi Council for Health Specialties evaluates various practitioners within Saudi Arabia and issues and renews medical licenses. Continuing medical education
and various medical societies are other issues on the agenda of the Saudi Council for Health Specialties.

Surgical training as prescribed by the Saudi Council includes 1 year in general surgery to acquire basic principles and skills, followed by 2 years of rotations, divided in 3-month blocks in the following specialties (not necessarily in this sequence): emergency room and trauma, intensive care, neurosurgery, orthopedics, pediatric surgery, urology, and vascular surgery. One elective is allowed. Currently, the elective is in thoracic surgery, applied pathology, or plastic surgery.

To progress from one year to the next, students must undergo an annual evaluation. This includes evaluation at the end of each rotation, an annual examination, and completion of a logbook. The logbook should include (1) operative procedures and technical skills acquired; (2) major invasive and non-invasive diagnostic and monitoring procedures; (3) participation and attendance of symposia, conferences, workshops, and training courses.

In addition, attendance at instructional activities not less than 75% of the time is required. These activities include clinical presentations, grand rounds, journal club, morning reports, mortality and morbidity conferences, surgical audit, surgical pathology meetings, surgical radiology meetings, surgical rounds, and tutorials.

### OPERATIVE PROCEDURES AND SKILLS

On completion of the training program, the trainee should have performed (under appropriate supervision) at least 430 surgical operations; 250 in general surgery and 180 in other surgical specialties. In addition, he or she should have assisted senior staff in at least 370 operations, of which 250 must be in general surgery and 320 in other specialties.

### EXAMINATIONS

The trainee must pass a written examination, called Part One of the Saudi Board, to progress to the senior years (fourth and fifth). He or she is allowed a maximum of 3 attempts. The senior years of training are where most of the refinement takes place. After completion of these 2 years, a written examination followed by clinical and oral examinations must be passed to attain the certificate of the Saudi Board in Surgery. The oral examination has 4 components: operative surgery, trauma and emergency surgery, surgical pathology, and principles of surgery.

### TRAINEES ENROLLED

In the academic year of 1998, there were 221 trainees in general surgery in 23 training centers. Other surgical specialties are also listed in the Table.

### RESEARCH

There are 2 sources for financial support of medical research in Saudi Arabia. The first is King Abdul Aziz City for Science and Technology, Riyadh. King Abdul Aziz City for Science and Technology funds research in various fields of concern to Saudi Arabia, including the biological sciences. It also sets and distributes a priority list to all academic institutions. The universities are the second funding source. Usually larger projects are funded by King Abdul Aziz City for Science and Technology.

### JOURNALS AND PERIODICALS

There are 9 regularly published medical journals from Saudi Arabia. Examples are the *Annals of Saudi Medicine* from King Faisal Hospital and Research Center, Riyadh; the *Journal of Family and Community Medicine* from King Faisal University; *Saud Med J* from the Armed Forces Hospital, Riyadh; the *Saudi Journal of Gastroenterology* from King Saud University; the *Saudi Journal of Kidney Diseases and Transplantation*, Riyadh; and the *Journal of the Saudi Heart Association*, Riyadh. Five are multidisciplinary and 4 are specialized. All are peer-reviewed journals. They are published in English and 2 print abstracts in Arabic. Two other journals are in the process of being established.

### MEDICAL SOCIETIES

There are several medical societies and clubs in Saudi Arabia. Some, such as the Saudi Gastroenterology Association, which has members who are gastroenterologists, surgeons, and pathologists, are multidisciplinary. Others are specialty societies, such as those for ophthalmology and otorhinolaryngology.

### THE FUTURE

1. The Saudi Council for Health Specialties will expand to cover all fields of health specialties in Saudi Arabia. That includes medical, dental, pharmacological, laboratory, nursing, and surgical specialties.

2. Other medical societies will be formed after the Saudi Council finishes formulating the required regulations.

3. Some form of medical insurance will be used in Saudi Arabia to share some of the cost of health care. At present, insurance is provided by major private and semiprivate companies in Saudi Arabia, either directly or

### Table: Distribution of Trainees and Training Centers in 5 Specialties in Saudi Arabia, 1998-1999

<table>
<thead>
<tr>
<th>Specialty</th>
<th>No. of Trainees</th>
<th>No. of Centers</th>
</tr>
</thead>
<tbody>
<tr>
<td>General surgery</td>
<td>221</td>
<td>23</td>
</tr>
<tr>
<td>Ear, nose, and throat</td>
<td>38</td>
<td>13</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>61</td>
<td>11</td>
</tr>
<tr>
<td>Orthopedic surgery</td>
<td>76</td>
<td>13</td>
</tr>
<tr>
<td>Urology</td>
<td>45</td>
<td>17</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>441</strong></td>
<td>NA*</td>
</tr>
</tbody>
</table>

*NA indicates not applicable.*
through social insurance. This program will expand to involve larger numbers of employers. Potentially, it will have an effect on medical training and practice.

4. The Saudi Council, in cooperation with the universities, will regulate and supervise clinical conferences, workshops, symposia, and other aspects of continuing medical education. This will be an essential part in licensing health care specialists. At present, the requirement for a license is passing a written examination and an interview.

5. The full effect of minimal-access surgery on surgical training remains to be assessed. Minimal-access surgery is nothing short of a revolution. Not only the Saudi Council of Health Specialties, but also all health care managers and the general public, should be concerned with its far-reaching consequences in all aspects of health care delivery.

6. The practice of outpatient and short-stay surgery started recently in Saudi Arabia and it is coming into practice more frequently. Its effect on inpatient care, training, and other associated practices needs to be evaluated by the Saudi Council of Health Specialties, third-party health care providers, and the public at large.

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REFERENCES


ARCHIVES OF NEUROLOGY

Carotid Endarterectomy: A Neurotherapeutic Advance

Henry J. M. Barnett, MD; Heather E. Meldrum

Egaz Moniz,¹ the pioneer of angiography, in the 1920s identified carotid artery lesions in patients who had experienced a stroke. In the early 1940s, Hultquist² published early pathological observations. It remained for C. Miller Fisher’s³ meticulous observations in the 1950s to focus attention on the importance of the extracranial portion of the carotid arteries as a prominent cause of ischemic stroke. Quickly the concept evolved of transient ischemic attacks as forerunners of ischemic infarction. Because surgeons had learned to repair arteries in the battlefields of World War II, it was predictable that pioneers would attempt to remove offending carotid arterial lesions. First to publish was the English team of Eastcott et al.⁴ An Argentinian and Americans missed the accolades of primacy by delaying publication.⁵,⁶


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