Surgery in Nigeria

Olajide Olaolu Ajayi, FRCS, FWACS, FMCS(Nig); Clement Adebayo Adebamowo, FWACS

Nigeria, like most other developing countries, is today experiencing an increasing incidence of noncommunicable diseases and the unsolved problem of infectious diseases. The role of surgery in the management of these diseases has continued to increase. Surgical training has traditionally been of a high standard, and this has made it possible for surgeons trained in Nigeria to cope with this change in the spectrum of diseases. A low success rate at the diploma examinations and an increasing loss of local talent to foreign countries has increased calls for a modification of the training programs. There is a need to improve the working conditions and environment of surgeons to stem the attrition. Surgery in a poor resource environment demands more, rather than less, skill from the surgeon, and the training programs must ensure that the specialist is adequately equipped to deal with conditions that may not be considered general surgery. While the unavailability of modern technology has limited the scope of research, it is still possible to conduct appropriate, “low-tech,” and relevant research that is subject to excellent study design, proper controls, and scientifically valid interpretations.

PREAMBLE

Nigeria is located in the Gulf of Guinea on the west coast of Africa. It has a land mass of 923,768 km² (about 356,669 sq mi), which makes it twice as large as California and 4 times the size of the United Kingdom. With a population estimated at 110 million, Nigeria is the most populous country in Africa. Selected health indicators from 1995 include an infant mortality rate of 87 per 1000 live births, a childhood mortality rate of 150 per 1000, a life expectancy at birth of 47.6 years, and a population growth rate of about 3%. The share of public health expenditure on health care in 1990 was 4.9%, which translates into 1.2% of the gross domestic product or gross national product. The physician-population ratio has fallen from 1:4300 in 1990 to 1:3707 in 1995. The population per hospital bed has risen from 1140 to 1477 during the same period.¹ The major causes of morbidity and mortality are malaria, dysentery, and pneumonia. With progressive industrialization and urbanization, Nigeria, like other developing countries, is experiencing an emerging pandemic of heart disease, cancer, hypertension, diabetes mellitus, sickle cell disease, and injuries.² Domestic, vehicular, and industrial injuries top the surgical problems in hospital practice. While there are about 14,000 health establishments in Nigeria, the centers where surgery is practicable are about 1100, excluding private clinics. These facilities include 15 accredited teaching hospitals associated with federal and state governments with an annually enrolled medical or health student population of more than 17,000. The teaching and specialist hospitals, of which there are currently 25, in addition to service and research, form the bastion of postgraduate medical education, which prepares candidates for the diploma of fellowship in surgery of the West African College of Surgeons and the Faculty of Surgery of the Nigerian National Postgraduate Medical College.

THE BEGINNING

The earliest recorded history of surgery in Africa dates back to Herophilus (circa 335-280 BC), who established the first medical school in the Alexandria of ancient Egypt. The early African practitioners of the art of
surgery founded the sciences of anatomy and physiology. They practiced such maneuvers as compression of the carotid arteries to induce loss of consciousness and of peripheral nerves to achieve regional analgesia. They described several surgical procedures for the management of injuries and ulcers, which were prevalent at that time. Practices that were induced by social taboos and cultural demands also proliferated continentally. Many of these practices, like circumcisions, scarifications, and tattooing, cannot be considered surgery because they are not healing procedures by manipulation. Other procedures that were practiced include cataract extraction, cervical lymphadenectomy, and immobilization of limb fractures. Some other procedures were performed for dubious reasons, such as uvulectomy to treat a sore throat and clitoridectomy to ensure fidelity. It was the art without the science.

The first Portuguese expedition to West Africa in 1482 brought European medicine into contact with Africans for the first time. However, the European medicine of those days was largely empirical and not too different from the traditional practices prevalent in West Africa. The establishment of what could be identified as modern medicine did not take place until almost 400 years later when all European settlements in Nigeria passed to the British in 1850. The initial health care service was devoted to the care of British soldiers, a process that accelerated when an epidemic destroyed the entire British garrison in 1756. With the formal colonization of Lagos, Nigeria, in 1850, health care services extended beyond military garrisons to colonial civil servants, excluding the local population. Missionary activities, however, resulted in increased health care services to ensure the good health of a select group of the local population, such as those working for the colonial government, and also to ensure the propagation of religious faith.

### UNDERGRADUATE TRAINING

The first recorded training of West African natives in Western medicine and surgery was in 1794 when a returned slave in Sierra Leone studied in the United Kingdom. He was Dr John Macauley Wilson. Two Nigerians were to follow more than 6 decades later: Dr William Broughton (of the Yoruba tribe), and Dr James Africannus Beale-Horton (of the Igbo tribe) who studied at the University of St Andrews and the University of Edinburgh in Scotland in 1858 and 1859, respectively. The first attempt at local training followed in Nigeria with the formation of the first colonial hospital in 1861. Of the initial intake of 4 trainees, 1 trainee became a medical practitioner in 1876. This program was probably not a formal training program and might have been the initiative of a colonial physician in search of assistants in the more mundane duties of a paramedical nature.

In 1932, the Higher College was established in Yaba, Lagos, with a medical program leading to a licentiate in medicine. The best students were enrolled there when the college took off in 1934. It was a peculiar institution in that the "pass list" was determined by the number of vacancies for assistant medical officers in the then colonial civil service. Many of the successful students subsequently proceeded to the United Kingdom to sit for the licentiate of the Royal College of Physicians of London and the membership of the Royal College of Surgeons of England.

The Higher College was succeeded by the establishment of the University College in Ibadan, Nigeria, in 1948 as an affiliate of the University of London to award the degrees of bachelor of medicine and bachelor of surgery and other degrees. Local training was limited to the basic sciences, while the clinical part of the program was completed in various teaching hospitals in the United Kingdom pending the completion, equipment, and staffing of a teaching hospital (University College Hospital). By 1961, all parts of the training program were completed in Ibadan, and the students admitted from 1962 onward were awarded the MBBS degree of the University of Ibadan.

### THE PROGRAM

With the advent of political independence in 1960, it became obvious that the workforce of the faculty of medicine in the University of Ibadan was never conceived to meet the health care needs of Nigeria. However, the proliferation of medical schools had to be tempered by the size of available funds. Equally important was the need to create a training program that was affordable and relevant to the health problems of the community and that would provide "sufficient acquaintance with fundamental principles of scientific methodology, some grounding in the art of clinical examination, a broad outline of human biology and the phenomenon of disease, an attitude of mind to learn on his own and an adequate sense of human values." The broad objectives were pursued within the existing limitations and the realities of the policy so that by 1997, there were 15 medical schools in the country.

The curriculum of each medical school is the sole responsibility of the senate of the respective university. The law, however, empowers the Medical and Dental Council of Nigeria to provide guidelines on the minimum standards of medical education and accredit training institutions at prescribed intervals, ensuring the maintenance of such standards. The council recognizes a clear distinction between basic medical sciences and the clinical sciences, although there are variations in some institutions that have integrated programs with a planned overlap between the 2 areas. The length of training is between 5 to 7 years depending on the student’s educational level at entry into the course. The clinical part of the program lasts about 6 semesters, with at least a 2-month period spent working in a rural area. The surgery content of the course consists of 2 postings, each lasting at least 2 months, in general surgery: 1 posting in the surgical specialties, such as pediatric, cardiothoracic, urologic, neurologic, orthopedic, and plastic surgery and burns. Two postings are also undertaken in anesthesia, ophthalmology, and otolaryngology. During the postings, the students are encouraged to have hands-on experience in every aspect of patient management. The period spent in rural settings provides the opportunity for more active involvement, decision mak-
ing, and performing simple surgical procedures. The degree examination consists of 4 parts: Part I, anatomy, physiology, and biochemistry; Part II, pharmacology and pathology; Part III, pediatrics, obstetrics, and gynecology; and Part IV, surgery, medicine, and preventive and social medicine. To satisfy the examiners in each of the subjects, continuous assessment scores, which are based on attendance and participation in several clinical activities, and the marks earned at the end-of-postings tests are taken into consideration in determining the final results. Failure in the clinical part of the examination leads to failure of the whole examination.

**POSTGRADUATE SURGICAL TRAINING**

In the preindependence era and for about the following 2 decades, postgraduate certification in surgery could only be obtained in overseas institutions, particularly in the United Kingdom and the United States. Indeed, the first specialist surgeon in West Africa was a Nigerian who was admitted into the fellowship of the Royal College of Surgeons of Edinburgh in 1938. The expanding health care services, the proliferation of medical schools, and the increasing reluctance of foreign institutions to accept a large number of trainees from the developing world forced a reappraisal of the strategies for postgraduate medical education in Nigeria. The need for self-reliance notwithstanding, the establishment of postgraduate medical education in Nigeria was also an opportunity to address the issues of training relevant to the environment, the development of skills appropriate to the socioeconomic status of the country, the availability of young trainees for service during the period of training, the opportunity to upgrade local facilities for service and research, and the containment of trained surgeons who remain in the overseas country of training.

The West African College of Surgeons grew from the Association of Surgeons of West Africa, which was founded in 1960. The decision to transform into a college was made in Accra, Ghana, in 1969. The association ceased to exist in 1973, when it transferred its assets and liabilities to the college in Benin City, Nigeria. The college prepared candidates and conducted examinations for the award of the fellowship diplomas of the college in anesthesia, dental surgery, obstetrics and gynecology, ophthalmology, otorhinolaryngology, radiology, and surgery. The programs in various faculties last 4 to 6 years depending on the areas of specialization and the availability of teachers in such specialties as neurosurgery and otorhinolaryngology. The program in surgery commences with the successful completion of the primary examinations, which consist of theory, practical, and oral examinations in anatomy, physiology, and pathology. The Part I examinations are taken at least 2 years later, after completing rotational posting in all the disciplines of surgery in accredited medical institutions anywhere in West Africa. The Part II examinations can be attempted after at least 2 more years of training, during which the candidate may opt for a particular specialty, such as urology, neurosurgery, orthopedic, pediatric, plastic, thoracic, and general surgery. The examinations in Parts I and II consist of written papers, multiple-choice questions, and clinical and oral sessions. No dissertation is required.

The Nigerian National Postgraduate Medical College was established by law in 1979 to be responsible for the postgraduate program of the Nigeria Medical Council, which had been in existence since 1970. The objective of the surgery component of the fellowship was “not to reproduce the University Postgraduate program in Surgery but to ensure a proficient training toward a specialist status in Surgery in Nigeria.” The diploma was acquired through a 5-year residency program that commenced after the compulsory preregistration year. The first 3 years were devoted to preliminary clinical training in the general principles of surgery apart from a 6-month course in basic sciences. The remaining 30 months were apportioned as follows: general and pediatric surgery (18 months); accident and emergency surgery (3 months); trauma and orthopedic surgery (3 months); ear, nose, and throat surgery (3 months); and neurosurgery and thoracic surgery (3 months). At the end of the postings, the candidate attempted the Part I examinations of the diploma of fellowship by writing 4 papers, with 3 hours for each paper, on the general principles of surgery, applied anatomy, applied physiology and biochemistry, and general principles of pathology. In addition, there was a clinical examination in surgery and an oral and practical examination in anatomy and physiology. The second phase of training leading to the Part II examinations was to specialize in a particular branch of surgery. The training period was for at least 2 years. At the end of this period, the candidate took an examination in general surgery, consisting of 2 written papers, with 3 hours for each paper, and clinical and oral examinations. Each candidate was required to present a dissertation or a casebook in the area of specialty, with comments on existing literature. The program has since been approximated to the West African college format except that a dissertation is still required. To supplement local training, a 1-year position at a surgical center abroad was undertaken, but this was difficult to organize and, in any case, has now become unaffordable in view of the present economic situation.

**THE CONTENT**

It is tempting to accept a surgical training program geared to the local circumstances and the local geographical pathologic conditions. The surgical training program in Nigeria strictly forbids this concept. One of us (O.O.A.) had the following to say on the matter more than a decade ago:

To train a surgeon locally because he is expected to practice locally irrespective of the facilities available and without regard to a defined minimum standard is to destroy the image and value of surgical care. To base training only on local disease patterns is a failure to appreciate the “non-static” nature of geographical pathology. To equate training with practice is not to recognize that the latter is only partially the product of the former. The acquisition of basic knowledge and skills which allow for professional self-development and adaptation is the core of good training and it is independent of geographical pathology or the venue of training.
The apparently comprehensive curriculum and the stiff examination processes result from the recognition that the poorer the available facilities, the greater the skills required in the practice of surgery. The surgeon working in isolation in a rural hospital with limited ancillary service triumphs only by a higher degree of technical competence, judgment, and experience. In addition to theoretical knowledge, the quality of clinical skills and evidence of adequate hands-on experience are keenly sought in prospective candidates for certification. To fail the clinical part of the examinations is tantamount to failure of the whole. The comprehensive education also explains the relative ease with which Nigerian-trained surgeons fit into a more sophisticated practice after becoming familiar with new technology.

THE CRITIQUE

It is the view of many that the demands of the surgical program cannot “appreciably increase the number of Fellows in the key disciplines in the future.”12 They further contend that the program “will ultimately be judged by its impact on the quality of healthcare in the country; not on how much expertise each of its products has.” Even if the objective is to produce “mini-academicians,” they think the current rate of production is outstripped by demand. Therefore, they advocate a “membership diploma” (as opposed to the current fellowship diploma) for successful candidates in the Part I examinations so that not becoming a fellow does not hinder “further career opportunities.”12

The opposite view is that to lower the hurdle that has been set to meet the minimum standard of a Nigerian surgical specialist makes no sense since there is a need to set the minimum standard of surgical competence in the first place. Lowering the minimum standard might bring the art and science of surgery into public odium since the patients have no way of preselecting “well-baked” and “half-baked” surgeons. They averred that it would lead to a continual downward revision of standards and create a cycle of poor-quality surgeons to train even poorer-quality successors. To compromise the minimum desirable standard of postgraduate training, they argued, is to undermine the quality of surgical services, teaching, and research.13 They contend that it would be socially divisive and would shift the focus from what we should be doing to correct the situation in the long term.

Both groups agree that what is required is a rational, pragmatic, sustainable, and balanced health care system that is adequately funded and efficiently administered. The answer would seem to be a higher investment in surgical training by upgrading the facilities and the provision of adequate remuneration and reward for the trainees and trainers. New knowledge in the health sciences, explosive advances in technology (with the consequential fragmentation and superspecialization in surgery), and a greater awareness of human rights in all communities of the world adds up to the need for higher, not lower, standards in training.

RESULTS

The high standards expected of successful candidates sitting for these examinations reflect the surgical needs of Nigeria and the circumstance of practice. A successful candidate has attained a consultant status in the practice of surgery, is potentially capable of further self-development, and is equipped to lead a health care team. In quantitative terms, the critics have a point, as evidenced by the examination results since inception. Table 1 is particularly informative with respect to the West African College of Surgeons since the commencement of its examinations in 1979. The number of attempts does not correlate with the number of candidates because repeated efforts were plentiful. The situation is similar in the Faculty of Surgery of the Nigerian National Postgraduate Medical College. From the records available from 1972 to September 1997, a total of 2473 attempts were made at the primary examinations, while 1296 and 367 attempts were made in Part I and Part II of the examinations, respectively. The number of candidates who actually completed the program is 140. The total number of surgeons produced during the periods by the 2 examining bodies is not additive because some candidates successfully attempted both examinations. Many of the eligible candidates for the Part II examination did not sit for the examination since they may have recommenced training in Canada, the United States, and Europe in search of better remuneration and a much more “enabling environment” for training.14 It is estimated that the Nigerian surgeons in practice in Canada, the United States, Europe, the Gulf states, and South Africa exceed the number of those in Nigeria.

THE SPECTRUM

The spectrum of surgical practice is a reflection of the disease pattern. The 3-tier stratification of the health care delivery system in Nigeria (primary, secondary, and tertiary care) corresponds to the level of surgical sophistication available at different levels. Gastroenterologic, urologic, orthopedic, cardiothoracic, oncologic, plastic and reconstructive, otorhinolaryngologic, endocrine, and vascular surgery are almost exclusively performed at tertiary health care centers, while primary health care surgery is limited to emergency first-aid care of minor trauma, suturing lacerations, splinting fractures, and incising and draining abscesses. The surgery often done is the surgery of trauma, infections, and neglect.15 The largest group of surgical cases is found at the secondary level of health care. In a 14-year review of a secondary level surgical practice, external hernia repair constituted 56.1% of the procedures undertaken, excision of superficial lumps about 11.5%, and abdominal emergencies, such as intestinal obstruction, peritonitis, and ruptured spleen, about 7.7% (Table 2).16 The broad-based training necessary for service in rural areas and those areas understaffed by physicians includes skills in cesarean sections, vesicovaginal fistula, and other gynecologic procedures. Surgery for tropical conditions, such as elephantiasis, chronic granulomatous diseases,AMEBOMA, and African histoplasmosis, typically accounts for only 12% of operations.17 Some of these conditions, though common in the tropics, are also seen in other parts of the world. What is characteristic of Nigeria is that patients with advanced disease tend to seek care in an environment where there are limited resources to cope with them.
Rural surgery is not primitive surgery or inferior surgery and may require more surgical capability beyond the conventional definition of the limits of general surgery. The absence of anesthetists adds to the professional competence required since all the procedures in the review were performed under spinal, intravenous, or local infiltration with lidocaine (Xylocaine; Astra USA Inc, Westboro, Mass).

RESEARCH

Without research, most of the diseases that are now well known and characterized in this environment would still be considered rare or nonexistent. Identifying local risk factors within the complex web of etiological factors in cross-cultural analytic studies is a worthwhile research activity even in a depressed economic situation. The unavailability of modern technology need not make impossible appropriate and relevant research that is subject to excellent study design, proper controls, and scientifically valid interpretations. It did not require much, if any, technology to demonstrate the cost-effectiveness of the ambulatory management of spinal tuberculosis or the relative safety of outpatient surgery that was initially dictated by the necessity to control the cost of health care. The other areas of significant contributions are in neurosurgery (head injuries due to missiles and subgaleal dermoid cyst in children), oncologic surgery (Burkitt lymphoma and breast and malignant trophoblastic disease), endocrinologic surgery (thyroidectomy), plastic and reconstructive surgery (immunologic characteristics of keloid and craniofacial anomalies), and orthopedic surgery (sickle cell disease).

Although there is a national institute for medical research in Nigeria, research support for surgery has been minimal. Most research efforts are at the institutional level, usually privately funded or funded in collaboration with nongovernmental international organizations. Yet the need for research is greater than ever before if only for the promotion of health, the prevention of disease, the identification of the changing pattern of disease, operational research for decision making, and the critical scientific appraisal of the value of some aspects of alternative medicine in surgical care. The forums for the exchange of information include organized scientific lectures under the aegis of professional associations, scientific meetings of the Nigerian Surgical Research Society, conferences of the West African College of Surgeons, the Nigerian National Post-
graduate Medical College, and the Nigerian chapter of the International College of Surgeons, to mention a few. Dissemination of research findings is further promoted through publication in local journals, especially the *African Journal of Medicine and Medical Sciences*, the *Nigerian Journal of Surgery*, and the *West African Journal of Medicine*.

**FINANCE**

Since surgery is a hospital-based discipline, it is, unlike other interventionist options in health care, very expensive. Increasingly sophisticated surgery and biotechnology has been adding to the cost of health care, which developing countries cannot afford or contain. Devaluation of national currencies and to adjust, have further widened the gap between hope and reality. Devaluation of national currencies and the collapse of apparently emerging markets have reduced social service expenditures in those countries to a trickle. The danger is that there may be no growth in surgical capabilities but, instead, a reduction to the level of an ignoble past. The large movement of people and material all over the world, the rapid changes in rural lifestyles, and increasing urbanization in developing countries are making new demands on sophisticated health care through changing geographical pathologic conditions. Cost-containment strategies will have to dictate the pattern of surgical services or further promote the rationing of surgical care. New indications for surgery are beginning to emerge from cost-effectiveness studies, cost-benefit analyses, and cost-containment activities.

Diminishing access to surgical care through prohibitive user fees have already altered the bed occupancy of teaching hospitals and changed the frequency ratios of diseases for the balanced instruction and experience of medical students and surgical trainees, respectively. In the socioeconomic circumstance of Nigeria, a meaningful health care standard, particularly in surgery, will depend on public funding for some time to come, notwithstanding the other options available for health care financing. In this situation, the state stands as the coordinator and guarantor of égalité and social justice in health care. Community involvement in the management of health care institutions will enhance efficiency and encourage patients to make financial contributions to their welfare while curtailing waste and abuse of the system. For the very poor and certain categories of patients (for example, children, pregnant women, and patients with communicable diseases), a system for exemptions will still be necessary.

**CONCLUSION**

This discourse on the current state of surgery in Nigeria is not meant to glorify the past, vilify the present, and destroy hope for the future. A forthright appraisal is the first step in determining the size of the problem and the prospect for a satisfactory amendment. No poor country has an excellent workforce development program or health care services. Economic prosperity must be sought before all other things can be added to it. Nigeria needs to accelerate relevant and appropriate development of the workforce, as it has done in the past, and create a scheme to safeguard its investment, as it has not done in the past, by measures suggested herein. Our training programs must be relevant, flexible, and adaptable to reflect our needs at all the 3 tiers of the health care system, and we cannot lose touch with new developments and technologies that can be used to manage the changing patterns of disease or the emergence of a new pandemic of diseases common in industrialized countries. The acquisition of management skills to ensure maximum returns from limited resources is an inevitable course for a brighter future. Specialization and new sophistication must be available to add to the skills of the Nigerian surgeon at the apex of the health care delivery system. Superspecialization and increasing fragmentation of surgical disciplines are not the pressing issues of surgical development in Nigeria at the moment. The reality of health care financing points to more effort at epidemiological and health care system research than laboratory animal research. The ability to make virtue out of necessity is the greatest and immediate challenge of all.

Reprints: Olajide Olaolu Ajayi, FRCS, FWACS, FMCS (Nig), Department of Surgery, University College Hospital, PMB 5116, Ibadan, Oyo State, Nigeria (e-mail: jide.ajayi@skan.net.com.ng).

**REFERENCES**

12. Ikeme AC. The triumph of hope over experience. Fourteenth convocation lecture presented at: National Postgraduate Medical College; September 12, 1996; Lagos, Nigeria.
13. Ajayi OO. The life and times of Professor Abayomi Bandele Bandiopo. First Bandiopo Bandiopo Memorial Lecture presented at: Medical and Dental Consultants Association of Nigeria; November 6, 1996; Lagos, Nigeria.