Western-style medicine in Mongolia was introduced in 1922. Today the health service structure is well adapted to the needs of the country. Surgery in Mongolia is performed by more than 300 surgeons who serve a population of 2.5 million people. The differences in geographical and settlement conditions create significant disparities in health needs between rural and urban populations. In this report we give an overview of the development and current status of medical service, disease patterns, and medical educational systems, including surgical specialty training.

HISTORICAL BACKGROUND

Current health care in Mongolia is influenced by the country’s history and geography. Documents from the 11th and 12th centuries reveal that Mongolian caregivers were knowledgeable about the diagnosis, treatment, and prevention of many diseases, including plague, measles, chickenpox, and smallpox. Until the end of the 19th century, medical services were in the hands of Buddhist monks who practiced traditional medicine that began a millennium before when nomadic tribes first formed their own states and Mongolia was at the intersection of great trading routes. In addition to Mongolian traditional medicine, these early healers were acquainted with Chinese, Tibetan, and Indian remedies. One of their strengths was the treatment of wounds and trauma. Historical evidence suggests that they were familiar with wound infection, fractures, and dislocations. Brain concussion was recognized and treated by massage.

Traditional medicine is still popular among the Mongols, especially those living in sparsely populated parts of the countryside where western medicine is not readily available. Instruction in the use of traditional techniques is sometimes incorporated into modern medical education.

GEOGRAPHY AND DEMOGRAPHICS

Covering 1,566,500 km², the country is nearly as large as the combined areas of Great Britain, France, Germany, and Italy. Topography is an obstacle to transportation and communication; dry deserts and wet mountains impede road building and maintenance. Mongolia’s average elevation of 1,580 m above sea level makes grazing animals rather than agriculture the principal means of obtaining food. Milk products predominate in rural diets. Climate creates problems for herders. Wide seasonal variations in temperature (as high as 40°C in the summer and as low as −45°C in the winter) interfere with the movement and feeding of sheep, horses, cows, and yaks.

As recently as 5 decades ago, the majority of Mongolians lived as nomadic herders on the grassy steppe that occupies the central and eastern portions of the country. Smaller populations lived in the Gobi, a vast desert in the south, or in the mountainous northwest. Today, 51% of Mongolia’s 2.5 million people reside in cities or towns. Ulaanbaatar, the capital, is home to nearly 1 million people. This change in demographics has had a profound effect on health care in Mongolia. New residents crowd into urban centers, often living in slums and shantytowns, and create unprecedented demand for medical services. People who remain in the vast rural areas of Mongolia are increasingly isolated and difficult to reach. The sheer size of Mongolia presents a challenge to providing medical care.

THE HEALTH SYSTEM

Mongolia is divided administratively into 21 aimags. Each has a population of 45,000 to 100,000 people. An aimag is subdivided into...
regions called soums. A soum typically has 3000 to 6000 people. The Ministry of Health used this governmental structure to develop a 4-step hospital referral system (Figure 1). A district-level, or soum, hospital has 10 to 20 beds and 1 or 2 general or family physicians. Its service radius is 15 to 60 km wide. An intermediate-level (inter-soum) hospital has 20 to 25 beds and a staff of 3 to 5 physicians, including a general surgeon, an obstetrician/gynecologist, and a pediatrician. It serves 2 to 3 soums in an area with a radius of 60 to 150 km. Regional-level hospitals of more than 100 beds are called aimag general hospitals and regional diagnosis and treatment centers. They are staffed by 30 to 60 physicians who practice a broad range of specialties. The population served may number from 45 000 to 100 000 people living within a radius of 150 to 250 km.

The highest-level general hospitals, called republican or central clinical hospitals, are all in the capital city, Ulaanbaatar. Typically, their bed capacity is 250 to 450 patients, and they accept referral patients from throughout the country. But owing to the present system of organization, these hospitals do not have beds for the treatment of patients with oncologic diseases. A number of specialty hospitals are also located in the capital. These include a large maternal and children’s hospital, an oncology hospital, an infectious disease hospital, a trauma/orthopaedic hospital, and a psychiatric hospital. All of these institutions plus 3 other obstetrical hospitals in Ulaanbaatar are owned and managed by the government. Currently, only a few private hospitals exist, but their number may increase sharply in the near future.

To appreciate the development of organized western-style medicine in Mongolia, it is important to realize that the National Health System dates from only 1922. Before then, medical care was irregular and inadequate. Only 2 Mongolian physicians had ever been trained in western medicine.\(^1\) Now, the number of physicians per 10 000 people is 44.1 in urban areas and 17.3 in rural areas. The number of hospital beds per 10 000 people is 87.9 in urban areas and 65.1 in rural areas (2003 estimate).\(^2\) The total number of health care workers in 2002 was 33 273, including 6823 physicians, 788 pharmacists, and 7802 nurses. The continued abundance of physicians has resulted in a high physician-nurse ratio of 1:1.14.

Expenditures for health care are 4.6% of the gross domestic product of Mongolia (in the United States, expenditures are 13.9% of the gross domestic product). Per capita health expenditures are $23.\(^3\) Today life expectancy in Mongolia is 62.7 years for men and 66.8 years for women (in contrast to Japan, 77.6 and 84.4 years; United States, 74.4 and 80.5 years; and United Kingdom, 75.7 and 80.7, respectively). The birth rate is 21.8 per 1000 people and the infant mortality rate is 23.5 per 1000 people.\(^3\)

Surgical epidemiology in Mongolia has dramatically changed during the last 3 decades. In the early 1960s, echinococcosis was one of the leading surgical diagnoses. Now, because of prophylactic measurement, it has become uncommon. Diseases of the circulatory system, neoplasms, trauma, and poisoning are the leading causes of morbidity and mortality in urban areas. Incidence of cancer in Mongolia has increased, with a higher incidence of liver cancer in both the male and female population. More than 80% of common cancer diseases have been diagnosed in stage III and IV. A 5-year survival rate in each cancer disease is 0% to 2% (unpublished data, Annual Report of National Cancer Center, 2002).

Modern medical techniques are being introduced rapidly. The first open heart operation was performed in 1958. Laser surgery was introduced in 1983. Laparoscopic cholecystectomy was first done in 1994 and is now commonplace. Kidney transplantation was attempted in 1995 but is now in abeyance pending development of an organ transplantation program.

Community health care is a developing part of Mongolia’s national health policy. In each health care area, corresponding to that of a level 1 hospital, there are primary health care centers where patients are seen by general practice physicians on an outpatient basis. Patients with obvious surgical problems are referred directly to hospitals with staff surgeons. Almost all of the people of Mongolia participate in a national health insurance plan. This means that care at virtually every level is either free or of minimal cost.

The Medical Mongolian State University was founded by the Ministry of Education in 1945 as the first “western” medical school. It is now called the University of Health Science. It graduates 150 to 205 students each year. A second medical school is just beginning to function in the Gobi Desert; it will have smaller classes. A school of traditional Mongolian medicine and 1 or 2 private medical schools are also training students.

**TRAINING: UNDERGRADUATE AND POSTGRADUATE**

Students seeking to enter the University of Health Science must have completed 11 years of general education and have graduated from secondary school. Admission is based on an entrance examination. The curriculum is 6 years in length. At the end of this time, a successful student is awarded a bachelor’s degree and is qualified

![Figure 1. Four-step hospital referral system in Mongolia.](https://archsurg.jamanetwork.com/)
as a doctor of medicine. This allows the graduate to practice as a general physician.

There are 2 paths to obtain postgraduate training in surgery. One is to enter a residency that emphasizes clinical experience. The other is to pursue a masters of education degree prior to becoming an academician. In either case, training must be done in a university affiliated with a hospital where senior surgeons and faculty of the University of Medical Science supervise specialty training. Programs are designed by special committees for each specialty and overseen by the Institute of Postgraduate Training. All of the central clinical hospitals are accredited for postgraduate surgical training.

Surgical residents are appointed for 2½ years. In addition to completing a basic science course, residents rotate among general surgery and surgical specialties, including thoracic, pediatric, urologic, oncologic, traumatologic, gynecologic, and laparoscopic surgery. The duration of rotations in specialty surgery can be shortened or lengthened depending on the interests of the resident. The longest period is spent in general and digestive surgery. Passing the general surgery examination qualifies the resident to practice as a surgeon, providing that accreditation has been obtained from the Ministry of Health.

A master’s degree in education is also obtained by completing a basic science course and general surgical training that lasts 2½ years, passing an examination, and successfully defending a thesis before a scientific committee selected by the University of Health Science. After residency and a master’s education, a doctorate in surgery can be obtained after an additional 3-year course, which includes foreign language, medical legislation, a research program, and a doctoral thesis. The latter must be defended before a scientific committee appointed by the University of Health Science.

Surgical specialty training is continuous in the sense that the resident progresses from junior to senior to chief surgeon. Each level has a final examination that covers clinical topics and operative techniques. Reaccreditation every 5 years is required and is granted on the basis of annual personal reports (Figure 2).

Newly trained surgeons enter a tight job market. Positions in urban and teaching hospitals are scarce, and many young surgeons work for several years in district hospitals where they may function in relative isolation. Continuing medical education is the exception rather than the rule. Neophyte surgeons often make important decisions in areas beyond their competence without the counsel of experienced colleagues, which provides valuable experience but risks patients’ well-being. After several years of practice, most surgeons can deal with standard surgical challenges and are able to provide competent care in general surgery, intensive care, surgical oncology, and trauma. Programs in surgical specialties are available to some of these surgeons as well as to newly trained residents in general surgery, and completing such programs leads to accreditation in a specialty and to receiving the title of specialist.

Figure 2. Scheme of postgraduate education in surgery.

SURGICAL SOCIETY

The Mongolian National Association of Surgeons was officially constituted in 1990. It is a professional society that includes general and specialty surgeons. Membership exceeds 300. The principal activity of the Mongolian National Association of Surgeons is to organize an annual scientific meeting at which papers submitted by members are presented and discussed. Some of these are published in the association’s official journal Mongolian Surgery. The Mongolian National Association of Surgeons is now a part of the International Federation of Surgical Colleges.

FUTURE

Surgery in Mongolia is making rapid strides but needs to improve in several respects. First, standards of surgical, anesthesiologic, and traumatologic care must be propagated as recommended by the World Health Organization. Second, the presence of specialty hospitals for trauma and oncology deprives general surgery faculty in the highest-level general hospitals of experience in important areas of surgical care. A better scheme would allow patients with trauma or cancer to be treated in the major general hospitals. Third, resources for health care need to be redistributed. For example, senior surgeons and professors are often unwilling to work in rural areas where their services are most needed. Fourth, postgraduate and diploma train-
Mongolia—to the western reader, the name evokes romantic images of sturdy horsemen galloping across the high steppes of central Asia. Dr Gunsentsoodol and his colleagues have done us all a service by introducing us to a modernizing state with a rich history and ancient culture struggling to provide modern medical care with limited resources to its citizens. The challenges facing Mongolian surgeons are similar to those confronting American surgeons: diseases of poverty caused by rural to urban population shifts, advanced malignancy caused by lack of access to proper health care, an increasing incidence of liver cancer presumably due to hepatitis B and C, concentration of surgeons in large cities resulting in limited access to surgical care for citizens living in rural areas, and surgical education.

The authors tell us that newly trained Mongolian surgeons often work in isolated district hospitals without the opportunity to consult with more experienced colleagues. This difficult challenge is also an exciting opportunity to harness the power of the Internet to solve both the problem of senior consultation in difficult cases and lack of continuing medical education opportunities for practicing surgeons.

Like their colleagues in America, Mongolian surgeons are struggling with the tension between the undeniable advantages of specialty surgical practice and the need for broadly trained general surgeons capable of providing high-quality care to citizens with limited health care access. I agree with the authors that dissemination of well-trained general surgeons with broad clinical capability is the best public health policy for a modernizing nation.

This article also challenges American surgeons, in general, and the American College of Surgeons, in particular, to engage our 300 Mongolian surgical colleagues in a dialogue for the ultimate benefit of all of our patients. We have the resources to reach out to our professional brethren in Mongolia. Will we rise to the challenge?

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