This article will provide a brief background on Argentina and then summarize the country's medical and surgical history, undergraduate and postgraduate training programs, residency programs, surgical associations, research, and the Argentinean Journal of Surgery (Revista Argentina de Cirugía). Surgery in Argentina is at the same level as that of most developed countries although transplantation, traumatology, and laparoscopic surgery have been emphasized.

Surgery is an essential discipline in the field of medicine in which solutions are difficult to find since they depend primarily on the socioeconomic, cultural, educational, and environmental conditions that interact with one another. Therefore, I find it necessary to provide a general background of Argentina before discussing the central topic of this article.

Argentina is located in the southernmost part of South America, has a surface of 3,000,000 km², and 36 million inhabitants (Figure 1). The population distribution is irregular, with over half of the country's inhabitants concentrated in the city of Buenos Aires and the surrounding suburbs. Only about 20% of the population resides in rural areas. Argentina is a young country with a very small Native American population; most of its inhabitants are of European descent, mainly Italian and Spanish, but a substantial number are of other ethnic origin.

Argentina has a federal republican representative form of government. The official language is Spanish and most Argentineans are Catholic, although they are free to worship as they please. The country allocates 7% of its gross domestic product to health care, which amounts to $650 per capita per year. Despite the fact that this is the highest amount allocated for health care services in Latin America, 35% of the population does not have medical insurance (Figure 2).

HISTORICAL BACKGROUND

Native American medicine did have not a substantial influence on modern medicine in Argentina, as it was not as developed as it was in other Latin American countries such as Mexico or Peru. During the colonial times, Spanish and Portuguese physicians introduced medical knowledge acquired in Europe. Simultaneously, Argentineans practiced self-medication, preparing their own medicines and caring for patients in their homes. They also consulted traditional healers.

As in most countries, surgery was practiced in the most primitive form by these traditional healers and others responsible for the health of the community. Before the country's emancipation from Spain, there were reports of occasional surgical procedures, performed mainly by missionary Jesuit priests of European origin, in the 17th and 18th centuries. Most of these priests and the first surgeons were Spanish and some were Portuguese. Later, some British surgeons came in slave ships and settled in Argentina. Toward the end of the 18th century, the Buenos Aires Board of Physicians, which was in charge of regulating and monitoring medical practice, was created.

The wars leading to the country's independence and consolidation created the need for military surgeons, the best known being Cosme Argerich (1756-1820).

The first medical school, established in 1821, was modeled after Spanish, British, and French university cur-
cula, ie, the academic bases of the medical profession in Argentina were universal, a characteristic that still prevails. The Academia Argentina de Medicina was founded in 1822. The first official surgery courses were taught by the Spanish surgeon Agustín Fabre (1749-1820) at the turn of the 19th century. In 1829, Juan José Montes de Oca (1806-1875) started teaching surgery and performing autopsies. One of his disciples, Ignacio Pirovano (1844-1895), came to be known as the father of Argentinean surgery. He started a trend of Argentinean graduates visiting Europe (mainly Paris, London, and Vienna).

Beginning in 1890, great progress ensued, led by Pirovano’s disciples Enrique Bazterrica, Andrés Llobet, Alejandro and Máximo Castro, Marcelino Herrera Vegas, and Alejandro Posadas. The latter was an exceptional surgeon who died at age 31 years, leaving behind many followers and original techniques.

After World War I, French medicine had a marked influence on local practice. Between World War I and World War II, the main influences were from France, Germany, Austria, Italy, England, and the United States; the latter became the primary influence in 1945.

In the second decade in the 20th century, Argentinean physicians made important and original contributions to the medical field. Three of them were awarded the Nobel prize: Bernardo A. Houssay (1947), in medicine and physiology; Luis Federico Leloir (1969), in chemistry; and Cesar Milstein (1984), in medicine.
Three great surgeons of the first half of the 20th century were José Arce and the brothers Enrique and Ricardo Finochietto. The elder brother, Enrique, was a great technician and designer of instruments, while Ricardo was a brilliant teacher who systematized surgery and had innumerable disciples who spread their art and knowledge throughout the country.

It is impossible within the range of this article to name all of the most brilliant Argentinean surgeons, many of whom trained in Europe and the United States. Some of the best, however, are mentioned below.

In 1914, Luis Agote performed the first transfusion with citrate to prevent coagulation (Figure 3). In 1931, Pablo Mirizzi performed the first intraoperative cholangiography, a procedure that was adopted worldwide (Figure 4). In 1932, Julio Diez described the technique of lumbar sympathectomy for peripheral vascular disease.

MEDICAL SCHOOLS AND UNDERGRADUATE SURGICAL TRAINING

In 1613, the Jesuits established the first university in Córdoba, a city located in the center of the country. At present, Argentina has 36 state and 40 private universities. There are 8 medical schools that are part of state universities and 11 private medical schools, 9 created since 1990.

In general, the undergraduate curriculum for the training of general physicians requires 6 years of study and, at some schools, a 1-year internship with rotations in the 4 basic departments (internal medicine, surgery, pediatrics, and tocogynecology) is also required.

Some schools, particularly those in the private sector, have admission requirements such as tests or prerequisite courses. However, these requirements are not uniform and the issue of how to standardize them is under debate both in the university community and in the public forum. This problem is also being addressed by the National Association of Medical Schools (AFACIMERA), an organization formed by the deans of the country’s medical schools, who have close ties with similar organizations in other American countries.

Both general surgery and the surgical specialties are taught during the last 3 years of the undergraduate curriculum (clinical cycle) in university hospitals or in affiliated institutions. Neither the contents of these courses nor the methods used for evaluating student performance are similar in all schools.

Although there is a high dropout rate during undergraduate studies (approximately 40%), an average of 4000 new physicians graduate every year. The diploma granted by the universities is the physician’s medical license, ie, it is the only requirement to practice. Provincial or local authorities usually require other credentials, such as completion of residency or additional courses to authorize the practice.

A surplus of new physicians graduate each year, and there are already more than 100,000 active physicians in Argentina, ie, 1 physician for every 360 inhabitants. Their geographical distribution is grossly distorted, as most physicians are concentrated in urban areas. In some major cities, the ratio of physicians to inhabitants is alarming. This constitutes a challenge for physicians seeking postgraduate education, since at present there are only about 1500 positions, both in public and private institutions,
for the training of residents in the various specialties and subspecialties.

POSTGRADUATE TRAINING

In the first half of the 20th century, postgraduate training was conducted by medical schools in cooperation with public hospitals. The quality and number of these programs increased during the last 30 years with the participation of all the public medical schools and some private ones together with most of the national, municipal, private, and community hospitals.

Augusto Moreno started the first residency in surgery in 1931, but it was only in 1958 that surgical residencies were officially introduced under the leadership of thoracic surgeon Mario Brea at the Teaching Hospital of the University of Buenos Aires. Together with Andrés Santas, they represented a strong modernizing force in medical education in Argentina. Since then, numerous residency programs in different specialties were established throughout the country. In 1967, the Residency Subcommittee of the Argentine Medical Association (Asociación Médica de Argentina) and the National Council for Medical Residencies (Consejo Nacional de Residencias Médicas) were founded to supervise the establishment of new programs and to control the approval and evaluation of medical procedures.

In 1989, the Argentine Association of Surgery (Asociación Argentina de Cirugía [AAC]) created the Residency Committee, which included representatives from several surgical disciplines, to assess and categorize residency programs. Of 105 programs in general surgery, 69 have been registered since 1989.

Admission to a residency program is based on the grade point average obtained during undergraduate studies, a multiple-choice examination of general medical knowledge, and a personal interview. There are residency programs in gynecology (which is becoming increasingly independent of the residency of general surgery), urology, orthopedics, traumatology, otolaryngology, and plastic, thoracic, cardiovascular, and pediatric (closely associated with the residence in pediatrics) surgery. To be admitted to these residency programs, physicians must have completed at least a partial residence in general surgery.

The different programs, which include a final year as chief resident, take from 4 to 5 years to complete. At the completion of the programs, the residents are not granted certification as specialists, since that is done by the corresponding surgical association.

In 1997, the Association for the Certification and Assessment of Postgraduate Medical Training in Argentina (ACAP), which encompasses all medical disciplines, was created. This strengthens the current trend toward increased involvement of scientific societies in medicine, which, with the proper legal support, will have a more active role in postgraduate training during the next century.

ARGENTINEAN ASSOCIATION OF SURGERY
(ASOCIACIÓN ARGENTINA DE CIRUGÍA)

The AAC, which was founded in 1930, has 3566 members; 2314 of them are full members and 1232 are associate members. The number of surgeons in Argentina has reached about 6000. To become a full AAC member, each applicant must have a minimum of 5 years of surgical training, submit a list of operations performed during the previous year, and pass a theoretical and practical examination. Moreover, the applicant must have the support of 6 full AAC members. A program for the recertification of surgeons was started in 1990, and 1496 members have been recertified as of 1997.

One of the main objectives of the AAC has been the organization of the Argentinean annual meeting of surgery, the main surgical meeting in the country. At the meeting, 2 official presentations on the state of the art of important surgical problems are discussed. Roundtables, lectures, colloquiums, postgraduate courses, television forums, and other activities are organized with the cooperation of sister scientific societies depending on the topics being discussed. More than 3000 surgeons from Argentina and neighboring countries attend the meeting, and surgeons from abroad with worldwide recognition are invited to participate every year. Major topics of recent meetings have been continuous education, residencies, recertification, bioethics, and the organization of surgical departments, as well as other issues that contribute to the improvement of the professional standing of surgeons, individually and as a group.

In the last few decades, the AAC has become actively involved in issues related to surgical practice as indicated, eg, by the central topic of the 1999 meeting: the role of the AAC in surgical practice. Recently, the AAC has entered a stage of active professionalization with the

Figure 5. Structure of the Argentine Association of Surgery.
The Argentine Academy of Surgery is the highest academic institution in surgery in Argentina. It was founded on September 30th, 1911, to promote the study and development of surgery. Initially called the Surgical Society of Buenos Aires (Sociedad de Cirugía de Buenos Aires), it was renamed the Argentine Academy of Surgery in 1942. Regular meetings are held every Wednesday from 7 to 8:30 PM, and sessions run from the first Wednesday in April to the last Wednesday in November. During these meetings, appointed members read their papers or those submitted by nonmembers for discussion. Most of the papers are published in the Argentine Journal of Surgery. The Academy consists of 70 principal academics, 40 associates, 40 national correspondents, 40 foreign correspondents, and an unlimited number of emeritus and honorary academics. The vacancies are filled based on qualification and depending on availability in each category. The Academy awards prizes and fellowships on the basis of the regulations established in its rules of proceedings.

ARGENTINEAN ACADEMY OF SURGERY (ACADEMIA ARGENTINA DE CIRUGÍA)

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ARGENTINEAN CHAPTER OF THE AMERICAN COLLEGE OF SURGEONS

In October 1954, a group of Argentinean surgeons, the Fellows of the ACS, developed the Argentinean chapter of the ACS, with Juan Martín Allende as the first governor and Rodolfo E. Pasman as the first chairman. At present, the Argentinean chapter consists of 171 fellows and is the largest in Latin America after the Mexican chapter. There are also 178 associate members. The Argentinean chapter has always worked closely with the AAC in an attempt to inspire it with the basic ACS objectives and to encourage Argentinean surgeons to become fellows. The Argentinean chapter has more recently organized special sessions during the annual meeting of surgery on topics essential for the improvement of surgery.

Also, it is worth highlighting the following events: the National Meeting on Medical Residencies (1963), the First Joint Meeting of South American Chapters (1966), the Fourth Latin American Meeting of ACS Fellows (1992), and the International Chapter Course conducted every June as of 1993 with special guests from the United States and a numerous attendance of surgeons. Also, in 1995 the Argentinean Chapter created the Chapter Committee of Trauma, which is in charge of the advanced trauma life support courses. The number of Argentinean surgeons attending the American Meeting of Surgery increases every year.

ARGENTINEAN JOURNAL OF SURGERY (REVISTA ARGENTINA DE CIRUGÍA)

The Argentine Journal of Surgery was first published in 1960 and is now the official journal of the AAC, which also publishes the documents by the Argentinean Academy of Surgery. This journal is published in 2 annual volumes of 4 issues, 3800 copies each. Also, there is a special edition that includes the presentations from the Argentinean Annual Meeting of Surgery. The journal is distributed to the associated members and all medical school libraries in Latin America and around the world. Although it is written in Spanish, all of its articles also include an abstract and key words translated into English.

The Argentinean Journal of Surgery is listed in the Latin American Index Medicus, and since 1991 has adopted the guidelines of the International Committee of Biological Editors. The Editor-in-Chief is the only Argentinean member of the Council of Biology Editors and will belong to its membership council until 2001. The journal has been included in a special CD-ROM package, along with other Argentinean journals such as Anestesiología, Cardiología, and Medicina de Buenos Aires, of which the 1995 volumes are comprised.

RESEARCH IN SURGERY

The incorporation of surgery and the development of related research at academic medical centers has followed essentially the same pattern as in other countries. Until about 1950, general surgery was considered a technical practice and, although Argentinean surgeons made significant contributions to the field, they were restricted to the description of new surgical procedures or to reports by specialized surgeons.

In the 1960s, surgery became a separate specialty at universities and, as did surgeons in the rest of the world, Argentinean surgeons started to play a key role in research, particularly in the field of critical care. With the first intensive care units, surgeons became actively involved in the interdisciplinary analysis of problems such as shock, infections, multisystem dysfunction, nutrition, and others, when the units devoted to experimental surgery were instrumental in the development of cardiovascular surgery and the emerging field of organ transplantation.

Since 1966, a Forum on Surgical Research, conceived and chaired by Andrés Santas until his death, is organized every year at the Argentinean Meeting of Surgery.

The interaction between surgical and other academic departments was strengthened in the 1980s when surgeons and basic scientists from areas such as molecular biology and physiology started a fruitful cooperation. As a result of this ongoing shared interest, Argentina has made important contributions in the field, such as the characterization of oxygen reactive metabolites in sepsis and shock, the use of tonometry for the prediction of outcome of septic patients, and the management of burned patients.

Most of the research in surgery has been carried out in tertiary health care centers where medical care, teaching, and research are concentrated. The motto “from the bench to the bedside” has guided modern surgical research laboratories. Both organ and cell transplantations are routinely performed, the physiopathology of criti-
cal patients is investigated, and tools derived from molecular biology are increasingly used for both diagnostic procedures and the development of techniques aimed at experimental gene transfer.

**LAPAROSCOPIC SURGERY**

In the past few years, laparoscopic surgery has represented a phenomenon that has affected the bases of traditional surgery and, therefore, the professional associations of surgeons.

The AAC immediately understood that laparoscopic surgery as well as endoscopic and mini-invasive surgery are variants of traditional surgery and should be handled by the general surgeon in the simplest cases (eg, cholecistectomy and appendectomy), and by the specialist in the most complex cases. Laparoscopic surgery is, therefore, not regarded as a new surgical discipline, but as a new surgical technique.

Under this view, the AAC has carried out and sponsored basic and advanced training courses in laparoscopic surgery. Certificates are granted after a committee evaluates the applicants’ skills, completion of required courses, and experience as a surgeon and assistant in laparoscopic surgery. The committee also monitors the laparoscopic surgery programs that are part of the residency, as approved by the AAC. Monitoring and certification of the laparoscopic practice is the role of the laparoscopic subcommittee, which is encompassed by the steering committee of the AAC. This subcommittee has organized 2 national consensus conferences, the first in 1996 on “Training and Certification in Surgery,” and the second in 1997 on “Laparoscopic Treatment of Gastroesophageal Reflux Disease.” This system is unlike that in most other countries, where specific associations have been created to regulate laparoscopic surgery.

**TRANSPLANTATION**

The first kidney transplantation in Argentina was performed in 1955. Toward the end of the 1980s and at the beginning of the 1990s, the first liver, heart, and lung transplantations were performed, and more recently pancreatic and renopancreatic transplantations have been performed. By 1980 and particularly as of 1990, the National Institute for the Coordination of Ablations and Transplantations (INCUCAI), within purview of the Ministry of Public Health, has been doing an excellent job educating society members in the area of organs donation. Nevertheless, the rate of organ and tissue donations in Argentina is growing at a low pace (Table). Figure 6 shows the number of solid organ transplantations carried out in 1995, 1996, and 1997. Kidney and heart transplantations are performed at various centers throughout the country. On the other hand, liver, lung, and pancreas transplantations are only performed in a few academic centers in Buenos Aires. Live related-donor transplantations have been performed in Argentina since 1992. Transplantation outcomes are generally comparable to world standards.

**TRAUMA**

Statistics show that trauma is the most common cause of death during the 3 first decades of life, and the third most common cause of death at any age worldwide. This is an issue of serious concern in Argentina, and Argentinean surgeons have always taken the lead in the management of trauma. In 1982, a group of surgeons from the AAC, led by Miguel Angel Gomez, organized a trauma
committee similar to the Committee of Trauma at the ACS (COT-ACS). Thus, the AAC Trauma Committee became the first academic and organic approach for trauma management in Argentina. The initial purposes were to divulge the standards for the treatment of traumatized patients; to set, adapt, and broadcast the standards for the categorization of patients and medical centers; to create a national database; to implement training programs for physicians; and to organize communication centers and joint activities with other associations.

The AAC Trauma Committee has established, divulged, and published the standards for the “Initial Management of Traumatized Patients,” “Guidelines for the Definite Management of Traumatized Patients,” “Guidelines for Air Transportation of Traumatized Patients,” and the “Principles for the Medical Coordination and Preparation for Catastrophes.”

In 1989, the AAC Trauma Committee, together with professionals belonging to the Argentinean Chapter of the ACS, organized the first course of advanced trauma life support trainers, and, through a joint effort with the Chapter Trauma Committee, started a professional training program for the management of the traumatized patient that represented a turning point in the history of emergency management in Argentina. The demand for these courses in medical centers and universities in all the provinces and the most important cities in the country has made Argentina one of the countries with the fastest developing trauma committees.

There are 40 ATLS trainers, and an average of 20 ATLS courses are conducted per year throughout the country. More than 2500 physicians have been certified in ATLS management.

The 3 Argentinean and the 2 Pan-American meetings on trauma that have been held and the meeting planned for the current year show that trauma management has become a multidisciplinary activity. The fact that specialists are interested in various disciplines encourages and fosters the creation of trauma committees in different professional associations. The acceptance by governmental organizations of the standards established by scientific associations has opened the door for trauma committees to influence national law in the areas of prevention, training, and certification. The close cooperation that has always existed between the AAC Trauma Committee and the COT-ACS is an example worth imitating.

**PEDIATRIC TRAUMA PROGRAM**

The Pediatric Trauma program was launched in 1989 within the framework of the Argentinean Association of Child Surgery (Asociación Argentina de Cirugía Infantil), the Argentinean Society of Pediatrics (Sociedad Argentina de Pediatría), and the AAC. Among its achievements are the Registry of Pediatric Trauma, the Advanced Courses of Initial Management of Traumatized Patients (24 courses conducted to date), the 2 advanced trauma life support trainers’ courses, the Interassociation Project of Trauma (a project that targets small communities), and the “Official Guidelines for the Initial Management of the Traumatized Pediatric Patient”. The Pediatric Trauma program has extended to other centers in Argentina, bordering countries, and Spain and has become a reference model at national and international levels.

I thank the AAC, its Residency, Publishing, Trauma, and Laparoscopic Committees and Subcommittees, the Academia Argentina de Cirugía, the Argentinean Chapter of the ASC, the National Institute for the Coordination of Ablations and Transplantations, and all of the professionals who have cooperated for the preparation of the manuscript.

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