With the sudden death of Christiaan Barnard in Cyprus on September 2, 2001, the world lost not only a pioneering cardiac surgeon but also a charismatic, if controversial, figure. On December 3, 1967, Chris Barnard led the surgical team that performed the first human-to-human heart transplant. The operation captured the public’s imagination as no procedure had before or since, and the personable Barnard rapidly became an international celebrity. Monarchs and heads of state honored him. According to French President Jacques Chirac, “Dr Barnard will remain the symbol of audacious modern medicine, able to surpass accepted ideas to bring solutions to victims of suffering and illness.”

Born on November 8, 1922, in the small country town of Beaufort West in South Africa, Christiaan Neethling Barnard was one of 4 sons of a church pastor who ministered to the poor. After graduating from the local high school, Barnard entered the University of Cape Town Medical School. By his own admission, he was not an outstanding student academically, but he worked hard and graduated as a doctor in 1946.

After spending a short period as a primary care physician and a resident in medicine, during which time he completed a dissertation on the treatment of tuberculous meningitis, Barnard began a busy surgical residency at Groote Schuur Hospital in Cape Town. By his own admission, he was not an outstanding student academically, but he worked hard and graduated as a doctor in 1946.

After spending a short period as a primary care physician and a resident in medicine, during which time he completed a dissertation on the treatment of tuberculous meningitis, Barnard began a busy surgical residency at Groote Schuur Hospital in Cape Town. In 1956, he received a scholarship to the University of Minnesota Medical School, where he soon was drawn to the emerging field of open heart surgery. During 2 highly productive and exciting years in the Department of Surgery under the direction of Richard Varco and C. Walton Lillehei, Barnard worked hard in both the clinic and the research laboratory. Some years later, Lillehei expressed his high regard for Barnard, particularly for his innovation, courage, “prodigious” memory, and “intensity and seriousness.” Lillehei noted that, although Barnard could be very charming, “...he could provoke a rather intense dislike among some people—colleagues and staff—because he was always outspoken and often had unconventional ideas.”

In 1958, Barnard returned to Cape Town as a specialist in cardiothoracic surgery and director of surgical research. He organized one of the first, and certainly the best, open heart surgery programs in Africa, working at both Groote Schuur and the nearby Red Cross Children’s Hospital. Although not the most dexterous surgeon, he had excellent surgical judgment and the ability to obtain the result he desired. He was, however, prone to outbursts of temper when the procedure was not progressing as well as he would have liked, and this trait antagonized several of his coworkers. Cape Town’s cardiac surgery program ranked with the best worldwide.

Several years before Barnard performed the first heart transplant, he had already earned international recognition, particularly for the repair of congenital anomalies. He was promoted to associate professor in 1962 and to professor of surgical science in 1972. It irked him that he was never given the title of professor of cardiac surgery.

To prepare for the first human heart transplant, Barnard and his brother Marius, who had trained in cardiac surgery at the Texas Heart Institute and had become Barnard’s right-hand man in Cape Town, practiced transplantation in dogs according to the Stanford technique. Barnard also spent 3 months at the Medical College of Virginia, gaining experience with immunosuppressive regimens for patients undergoing kidney transplantation.

There is a widely held misconception that one reason why the first human heart transplant was performed in South Africa was that the brain-death laws were more permissive in that country than in Europe and North America. At that time, however, there were no laws related to brain death either in South Africa or anywhere else. Barnard took a bold step. He invited the local medical examiner to come to the operating room to monitor the patient as mechanical ventilation was discontinued. When the donor’s heart stopped beating and the electrocardiographic tracing became flat, the medical examiner pronounced that death had occurred. Barnard’s assistants then opened the chest, initiated pump-oxygenator support, and cooled and excised the heart. Meanwhile, Barnard and his brother Marius prepared the recipient. After the transplant, the heart functioned satisfactorily. As news of the event spread, the world’s press descended on Cape Town.
Town, and Christiaan Barnard became a household name. This experience promoted discussions related to the concept of brain death, eventually opening the way for other surgeons to begin transplanting hearts.

Although the first transplant recipient, Louis Washkansky, died of pneumonia after 18 days, Barnard soon performed a second transplant using a slightly modified surgical technique. The incision in the right atrium of the donor heart was extended from the inferior vena cava into the atrial appendage, avoiding the sinus node at the root of the superior vena cava. Subsequently, nearly all heart surgeons used this modified procedure. The second patient, Philip Blaiberg, eventually was able to leave hospital, and he led an active life for almost 19 months. It was this success, perhaps more than any other single factor, that suggested that heart transplantation eventually would become a valuable treatment option. Nevertheless, Blaiberg’s autopsy showed severe and widespread coronary artery disease, one of the first examples of graft atherosclerosis, which is now the major cause of late graft failure.

Between 1967 and 1973, Barnard’s team performed only 10 orthotopic heart transplants. The results, although poor by today’s standards, were exceptional when one considers the primitive nature of the immunosuppressive therapy available and the team’s lack of experience in diagnosing and treating tissue rejection. The first 4 patients survived for an average of almost 300 days and, quite remarkably, the next 2 patients lived for more than 13 and 23 years, respectively.

From this experience, Barnard became an outspoken advocate for boldness and heroics in medical practice, awakening the scientific world to a new era. As he said, “I’ve never been a good spectator. Either I’m playing the game or I’m not interested.” Chris was determined to withstand the criticism of skeptics. He traveled extensively, speaking to both the medical profession and the public, sometimes using these opportunities to try to present a balanced view of his troubled homeland. He was an outstanding and entertaining public speaker, whose directness, engaging smile, and sense of humor came to the fore in media interviews. He mixed with the rich and famous, developing a taste for the “good life” and acquiring a reputation as something of a playboy.

In 1970, Barnard’s autobiography One Life, ghostwritten by an experienced professional writer, was a major publishing success worldwide. Barnard generously donated the royalties to a Cape Town fund that supported research into heart disease and organ transplantation. He subsequently authored several lay-oriented books on health-related matters, collaborated with a well-known South African novelist on several popular works of fiction, and contributed a weekly newspaper column to the Cape Times.

During the 1970s, the Cape Town transplantation program was one of only 4 such programs worldwide that continued to gain experience in heart transplantation. In 1974, Barnard and his junior colleague, Jacques Losman, developed the technique of auxiliary (heterotopic) heart transplantation, in which the donor heart is placed in the chest alongside the patient’s own heart. Between 1974 and 1983, Barnard and his team performed 49 consecutive heterotopic heart transplants in Cape Town, yielding moderately good results for that era. The main advantage of this operation was that, if the donor heart underwent severe tissue rejection, it would not necessarily be fatal, because the patient’s natural heart could support the circulation for a limited period. When improved immunosuppressive drugs became available in the early 1980s, the “piggyback” transplant was largely phased out. On 2 occasions in 1977, when a patient’s left ventricle failed acutely after conventional open heart surgery, Barnard transplanted a xenograft auxiliary heart (obtained from a chimpanzee and baboon, respectively) with the hope that it would support the patient until the native heart could recover. Sadly, neither patient survived.

During the early 1980s, Barnard’s group developed a hypothermic perfusion system that extended the time that animal hearts could be stored ex vivo. The system was used clinically on several occasions, donor hearts being successfully stored for up to 13 hours. In these cases, physicians observed that brain death had a detrimental effect on myocardial function. This observation led to extensive investigations of the pathophysiology of brain death in both animals and humans, yielding information that proved valuable in managing potential organ donors.

By the 1980s, Barnard’s zest for surgery had been waning for some time, in part because his hands were affected by painful rheumatoid arthritis. In 1983, at age 61, he took early retirement. This gave him the opportunity to expand his several business and other interests, the most controversial being his link with the Clinique La Prairie in Switzerland, which offered “rejuvenation” therapy involving injections of extracts from sheep fetuses. Barnard’s involvement in an advertising campaign for Glycel, a cream purported to help prevent aging of the skin, was heavily criticized and tarnished his image. He also took an interest in a large sheep farm in South Africa, which he transformed into a game reserve. He advised the newly formed Oklahoma Transplantation Institute in Oklahoma City about the development of a successful heart transplantation program. In addition, he wrote a sequel to his original autobiography, this time entitled The Second Life, in which he documented his varied experiences after the first heart transplant. This book devoted as much attention to his personal and social life as to his professional life, reflecting his changing priorities during those years. Throughout his life, Barnard used his fame to benefit the poor and oppressed people of South Africa as they struggled under apartheid. Because he felt great compassion for human beings of all races and nationalities, he established the Christiaan Barnard Foundation to fund charitable and humanitarian causes.

Chris Barnard exhibited an unforgettable blend of vision, intelligence, action, kindness, charm, warmth, and humor, tempered by human frailties. Despite these frailties, he made the world a better place for his many patients, colleagues, and friends. He was a special man who enjoyed life and contributed much to human health and welfare. Like others who enjoyed a long-standing friendship with Chris, we feel a deep sense of personal loss at his passing. He was a good person and a good friend. The experiences we shared have become cherished memories.

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Christiaan Neethling Barnard: 1922-2001
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