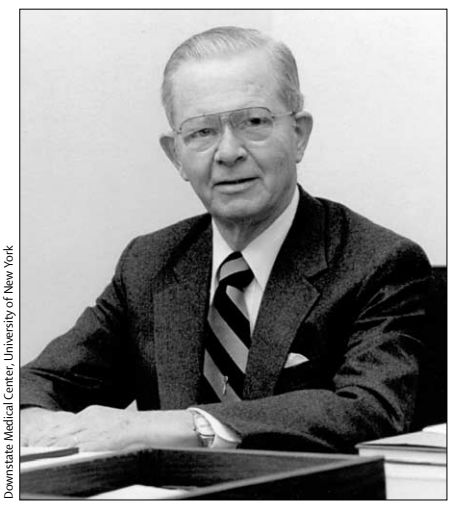

Downstate Medical Center, University of New York

Clarence Dennis

Co-inventor of a heart-lung machine. Born June 16, 1909, in St Paul, MN, USA; he died of complications of dementia in St Paul on July 11, 2005, aged 96 years.

Clarence Dennis did the first open-heart surgery using a multiple screen blood oxygenator that he had developed—later known as a heart-lung machine—in April, 1951, at the University of Minnesota, Minneapolis, MN, USA. "The behaviour of the oxygenator was most gratifying", Dennis would later say in an interview with W Gerald Rainer, former president of The Society of Thoracic Surgeons. However, Dennis would recall, "when the right heart was opened in order to try to make the necessary repair, it was found that this patient had a much more complicated lesion which neither [another surgeon] nor I recognised while the child was alive. The child, therefore, was lost on the table." That, combined with a second failed surgery caused by a technician's error a month later set Dennis back and made it possible for John Gibbon, a surgeon at Jefferson University, Philadelphia, PA, with whom Dennis had been sharing notes on the device, to do the first successful such surgery in 1953. Dennis, who moved to the State University of New York Downstate Medical Center in Brooklyn shortly after his 1951 attempts, would be successful in 1955.

Although Gibbon got the credit for the first successful surgery, the development of a pump oxygenator that could maintain the artificial cardiac arrest that was necessary to operate on the heart "revolutionised cardiac surgery", said Michael Zenilman, who is Clarence and Mary Dennis Professor and Chairman at the Department of Surgery at Downstate Medical Center. Such surgery would not have been possible without Dennis' work, "Before that, you could not operate on the heart because it was a beating organ".

Martin Kaplitt, a cardiovascular surgeon who trained at Downstate under Dennis, called him "one of the greatest men in American surgery". "Whether it was performing a closed anastomosis of the bowel with 'Dennis clamps' or performing a coronary gas endarterectomy on a patient in cardiogenic shock while on cardiopulmonary bypass, the guidance, equanimity, and encouragement provided by Dr Dennis always led to either success or at the least a great advance in surgical knowledge." Michael Mastrangelo, who trained with Dennis as a thoracic surgery resident at Downstate, said Dennis was "a meticulous and most gentle surgeon". Gus Tanaka, one of his first interns at Downstate, remembered his kindness. After Tanaka was diagnosed with a tuberculous pulmonary effusion, a week after being selected for the internship, rather than advising him to seek another career path, as Tanaka feared, "the kindly Dr Dennis came to my bedside and assured me that I would not be dropped from the programme", and outlined a programme that would assure Tanaka a better chance of getting a decent night's rest.

Dennis chaired Downstate's Department of Surgery until 1972, when he went to work at the National Heart and Lung Institute in Bethesda, MD. In 1975, he was appointed to the faculty of State University of New York Stony Brook, where he would remain until his retirement in 1988, when he moved back to St Paul. In 1991, he became director of the University of Minnesota's Cancer Detection Center, which had been founded by Owen Wangensteen, who had, in the 1930s, first assigned Dennis to creating a pump oxygenator. The center closed in 1996, at which point Dennis retired for a second time.

Dennis loved to tinker in machine shops and his own garage, which is where one of the first ventricular assist devices was developed. One of his first inventions was an atraumatic clamp, now known as the Dennis clamp, "that holds the intestine while you're sewing it up", said David Rothenberger, who worked with him in Minnesota. After Dennis developed macular degeneration, he put together a video player that made it possible for him to see slides during grand rounds, according to John Najarian, of the University of Minnesota. "He had this contraption on his head that would look at the slides and then put them on a television screen that was in front of his eyes, about the size of a 3-by-4 card, and he would see everything in that fashion." His last patent was for a bread slicer in 1999.

His first wife, Eleanor Smith, predeceased him; their marriage ended in divorce. Dennis is survived by his wife, Mary; a daughter, Jane Wigertz; three sons, Richard, James, and David; two stepchildren, Katherine Franda and Gregory Mott; a brother, Lyman Clark Dennis; and a sister, Clara Louise Jameson.

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