Medical Devices Timeline

1881

Sphygmomanometer Invented

Samuel Siegfried Karl Ritter von Basch invents the device to measure blood pressure in patients. Harvey Cushing discovered and popularized this device in 1901.

1885

kodak.com

First X-Ray Image of a Human

Wilhem Röntgen discovered the medical use of X-rays when he saw a picture of his wife's hand on a photographic plate formed due to X-rays. His wife's hand's photograph was the first ever photograph of a human body part using X-rays

1885

Electrocardiograph Machine

Willem Einthoven develops the first electrocardiograph machine. After attaching electrodes to both arms and the left leg of his patient, Einthoven is able to record the heart's wave patterns as the string deflects, obstructing a beam of light whose shadow is then recorded on a photographic plate or paper. In 1924 Einthoven is awarded the Nobel Prize in medicine for his discovery.

1899

Radiation Therapy in Cancer

Radiation therapy was first used in the treatment of cancer after X-Rays were used to identify cancer. Throughout the 20th century physicians made advances in how to better treat cancer patients with radiation. Advances included minimizing damage to surrounding tissue and changing the dosage and frequency of radiation treatments.

1913

Mammography Research

Albert Solomon uses a conventional X-ray machine to produce images of 3,000 gross anatomic mastectomy specimens, observing black spots at the centers of breast carcinomas. Mammography, the resulting imaging, has been used since 1927 as a diagnostic tool in the early detection of breast cancer.

1927

Respirator

Philip Drinker and Louis Agassiz Shaw devise the first modern practical respirator using an iron box and two vacuum cleaners. It encloses the entire bodies of its first users, polio sufferers with chest paralysis. Pumps raise and lower the pressure within the respirator's chamber, exerting a pull-push motion on the patients' chests. Only their heads protrude from the huge cylindrical steel drum.

Library.ohio.gov

1933

Research Leading to Electric Defibrillators and CPR

Working on rats and dogs William B. Kouwenhoven and Orthello Langworthy discover that while a low-voltage shock can cause ventricular fibrillation, or arrhythmia, a second surge of electricity, or counter-shock, can restore the heart's normal rhythm and contraction. This leads to the development of the closed-chest electric defibrillator and the technique of external cardiac massage today known as cardiopulmonary resuscitation, or CPR.

1945

Kidney Dialysis Machine

Willem J. Kolff successfully treats a dying patient with an "artificial kidney," the first kidney dialysis machine. Kolff's creation is made of wooden drums, cellophane tubing, and laundry tubs and is able to draw the woman's blood, clean it of impurities, and pump it back into her body.

1948

Plastic Contact Lens

Kevin Touhy receives a patent for a plastic contact lens designed to cover only the eye's cornea, a major change from earlier designs. Two years later George Butterfield introduces a lens that is molded to fit the cornea's contours rather than lie flat atop it. As the industry evolves, the diameter of contact lenses gradually shrinks.

wn.com

1951

heart-valve-surgery.com

Artificial Heart Valve

Charles Hufnagel develops an artificial heart valve and performs the first artificial valve implantation surgery in a human patient the following year. The first replacement valve surgeries are performed in 1960 by two surgeons who develop their ball-in-cage designs independently. The Starr-Edwards heart valve is born and is still in use today.

1952

First Pacemaker

Paul M. Zoll and the Electrodyne Company develop the first successful cardiac pacemaker. The bulky device, worn externally on the patient's belt, plugs into an electric wall socket and stimulates the heart through two metal electrodes placed on the patient's bare chest. Five years later doctors begin implanting electrodes into chests. Around the same time a battery-powered external machine is developed by Earl Bakken and C. Walton Lillehei.

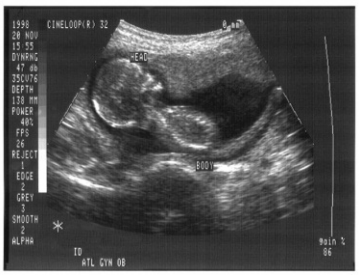
pbs.org

1958

Imaging Device to Detect Tumors

Hal Anger invents a medical imaging device that enables physicians to detect tumors and make diagnoses by imaging gamma rays emitted by radioactive isotopes. Now the most common nuclear medicine imaging instrument worldwide, the gamma rays interact with a crystal that emits visible light. The light is detected by a sensitive camera and the image is able to be read by a doctor.

1959



phil.cdc.gov

Ultrasound

Ian Donald develops practical technology and applications for ultrasound as a diagnostic tool in obstetrics and gynecology. Ultrasound displays images on a screen of tissues or organs formed by the echoes of inaudible sound waves at high frequencies (20,000 or more vibrations per second) beamed into the body. The technique is used to look for tumors, analyze bone structure, or examine the health of an unborn baby.

1950s

Artificial Hip Replacement

John Charnley applies engineering principles to orthopedics and develops the first artificial hip replacement procedure, or arthroplasty. In 1962 he devises a low-friction, high-density polythene suitable for artificial hip joints and pioneers the use of methyl methacrylate cement for holding the metal prosthesis, or implant, to the shaft of the femur. Charnley's principles are subsequently adopted for other joint replacements, including the knee and shoulder. Titanium became the metal of choice because of its strength to weight ratio and because the body's immune system does not reject it.

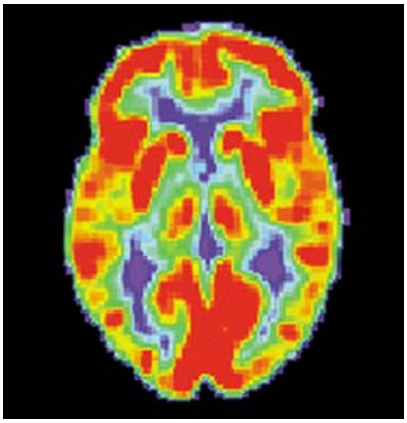
healthbase.com

1960

First Internal Pacemaker

Wilson Greatbatch develops the first totally internal pacemaker using two commercial silicon transistors. William Chardack implants the device into 10 fatally ill patients. The first patient lives for 18 months, another for 30 years.

1962



today.duke.edu

PET Tranverse Section Instrument

Sy Rankowitz and James Robertson invent the first positron emission tomography (PET) camera. It uses the annihilation of positrons, an anti-matter form of electrons, to produce two gamma rays directed in opposite directions. The two gamma rays detected simultaneously indicate a line where the positron was produced. It is most often used to detect cancer and to examine the effects of cancer therapy. A decade later single-photon emission tomography (SPECT) methods become capable of yielding accurate information similar to PET by incorporating mathematical algorithms by Thomas Budinger and Grant Gullberg.

1963

Laser Treatments to Prevent Blindness

Francis L'Esperance begins working with a ruby laser photo-coagulator to treat diabetic retinopathy, a complication of diabetes and a leading cause of blindness in the United States. In 1965 he begins working with Eugene Gordon and Edward Labuda to design an argon laser for eye surgery. In early 1968, after further refinements and careful experiments, L'Esperance begins using the argon-ion laser to treat patients with diabetic retinopathy.

1969

Portable Glucose Monitor

For the first time, blood glucose levels were able to be monitored at home, allowing patients with diabetes a healthier, better quality of life. The first blood glucose monitor was invented by Tom Clemens and manufactured by the Ames Diagnostics (now part of Bayer.

1971

First Soft Contact Lens

Bausch & Lomb licenses Softlens, the first soft contact lens. The new product is the result of years of research by Czech scientists Otto Wichterle and Drahoslav Lim and is based on their earlier invention of a "hydrophilic" gel, a polymer material that is compatible with living tissue and therefore suitable for eye implants. Soft contacts allow more oxygen to reach the eye's cornea than do hard plastic lenses.

solidworks.co.uk

1972

radrounds.com

First CT Scan

Godfrey Hounsfield and Allan Cormack develop the computerized axial tomography scanner, or CAT scan. With the help of a computer, the device combines many x-ray images to generate cross-sectional views as well as three-dimensional images of internal organs and structures. Used to guide the placement of instruments or treatments, CAT eventually becomes the primary tool for diagnosing brain and spinal disorders.

1972

MRI for Medical Purposes

Using high-speed computers, magnetic resonance imaging (MRI) is adapted for medical purposes, offering better discrimination of soft tissue than X-ray CAT and is now widely used for noninvasive imaging throughout the body.

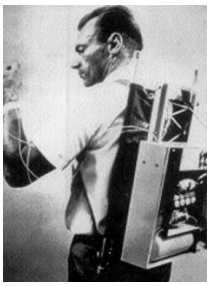
1978

First Cochlear Implant

Graeme Clarke carries out the first cochlear implant surgery. Advances in integrated circuit technology enable him to design a multiple electrode receiver-stimulator unit about the size of a quarter.

wellsphere.org

1979



medscape.org

Portable Insulin Pump

The first insulin pump was invented and designed to mimic the body's normal release of insulin by providing a stream of insulin through tubes inserted into a site on the abdomen. The first pumps were large and bulky and had to be carried in a backpack. Today, the pumps are light and compact and can easily be carried in a pocket or clipped to a belt.

1970s

First Arthroscope

Advances in fiber-optics technology give surgeons a view into joints and other surgical sites through an arthroscope, an instrument the diameter of a pencil, containing a small lens and light system, with a video camera at the outer end. Used initially as a diagnostic tool prior to open surgery, arthroscopic surgery, with its minimal incisions and generally shorter recovery time, is soon widely used to treat a variety of joint problems.

1980s

Controlled Drug Delivery

Robert Langer develops the foundation of today's controlled drug delivery technology. Using pellets of degradable and nondegradable polymers such as polyglycolic acid, he fashions a porous structure that allows the slow diffusion of large molecules.

1982

pathology.jhu.edu

First Permanent Artificial Heart Implant

A patient receives the first permanent artificial heart, a silicone and rubber device designed by many collaborators. He survives for 112 days with his pneumatically driven heart.

1985

Implantable Cardioverter Defibrillator (ICD)

The FDA approves Michel Mirowski's implantable cardioverter defibrillator (ICD), an electronic device to monitor and correct abnormal heart rhythms, and specifies that patients must have survived two cardiac arrests to qualify for ICD implantation. It weighs 9 ounces and is roughly the size of a deck of cards.

pbs.org

1986

First Coronary Stent

Puel and Sigwart implanted the first coronary stent in a human patient. The technology advanced as materials used to make the stent improved patient responses to the device.

1987

Deep Brain Electrical Stimulation

France's Alim-Louis Benabid implants a deep-brain electrical stimulation system into a patient with advanced Parkinson's disease. The experimental treatment is also used for dystonia, a debilitating disorder that causes involuntary and painful muscle contractions and spasms, and is given when oral medications fail.

1987

First Laser Surgery on a Human Cornea

Steven Trokel performs the first laser surgery on a human cornea, after perfecting his technique on a cow's eye. Nine years later the first computerized excimer laser—Lasik—designed to correct the refractive error myopia, is approved for use in the United States. The Lasik procedure has evolved from both the Russian-developed radial keratotomy and its laser-based successor photorefractive keratectomy.

2002

First combined CT and Radiation Delivery Method

Researchers in Wisconsin developed a unit that combines CT and radiation delivery technologies. system provided more effective treatment deliveries, minimizing patient side effects. The machine provides 360° rotation of the radiation source and allows treatment to the entire tumor.

accuray.com

2009

dekaresearch.com

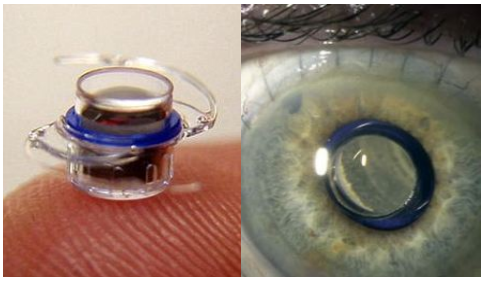
DEKA Prosthetic Arm

The Defense Advances Research Projects Agency (DARPA) of the U.S. government reports that they are developing a technology that allows amputees to control fine movements in an advanced prosthetic arm. The user thinks about moving their arm, muscles move in their shoulder, and the sensors in the device send signals to the limb to move in the specific way desired. This technology is not yet released to the public.

2010

Implantable Miniature Telescope

Dr. Isaac Liphitz, of VisionCare Ophthalmic Technologies, Inc., developed a small telescope that alleviates the blind-spot vision loss from End-Stage Age related macular degeneration. It is implanted into the eye behind the iris in place of the lens and telescope magnifies images to 2 or 3 times their normal size. The magnification allows central images to be projected onto healthy areas of the retina. This helps reduce the 'blind spot' and allows the patient to distinguish and discern images that may have been unrecognizable or difficult to see.



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