# Design for Life
## Large Print Guide

# Contents





*Design for Life*
Large print guide

Powerhouse Museum
Museum of Applied Arts and Sciences
500 Harris Street
Ultimo NSW 2007
Australia
+ 61 2 9217 0111

**maas.museum**

Interdisciplinary partnerships between medical science and the design industry have pioneered technologies that have advanced our bodies to new biological limits. Medical equipment, once limited to laboratories and hospitals, has been reimagined as small-scale devices for use in the home and on the body. These portable and personalised products are made with the user experience in mind to assist us with our breathing, monitor our hearts, examine our blood, improve our brain and body function, and deliver our medicine and drugs.

At a time in which our focus on healthcare is amplified, *Design for Life* investigates the role of design research and development within the production of medical technologies and scientific product design. Recent design industry collaborations are presented alongside the Powerhouse collection of scientific and medical material ranging from the late 1800s to present day.

# 1.0.0 Blood and Analysis

**Before the advent of modern medicine, blood was recognised for its important connection to life and death. We can extract, clean and test blood for markers of disease, with these tests often confined to large medical facilities. Today, designers and medical experts are working together to bring lab accuracy to the wider community, with devices that allow us to test blood quickly and with greater precision, including in our homes and in regional areas.**

---

To help regulate glucose (sugar) in the blood, insulin pens emerged in 1985 as an alternative to glass vials and syringes. They are designed to deliver exact doses of insulin and can be adjusted to meet individual need.

1.1.1 Medi-Jector EZ
Made by Medi-Ject Corporation, 1997. Gift of Medi-Ject Corporation, 1997

1.1.2 BD Pen, 3 ml
Made by Becton Dickinson and Co, 1996. Gift of Becton Dickinson Pty Ltd, 1997

1.1.3 BD Pen, 1.5 ml
Made by Becton Dickinson and Co, 1996. Gift of Becton Dickinson Pty Ltd, 1997

1.1.4 Accu-Chek Active lancing device
Made by Roche Diagnostics, Germany, 2003. Gift of Roche Diagnostics Australia, makers of Accu-Chek products, 2006

1.1.5 HumaPen insulin injector
Made by Eli Lily and Company, 1997–99. MAAS Collection, 2013

After young diabetic Lisa Clark had her blood tested in hospital with a heavy mains-powered meter, her father, Sydney-based inventor Stan Clark, designed a world-first portable monitor to enable children to measure their own blood-glucose levels.

1.2.1 Musical prototype blood-glucose meter
Designed and made by Stan Clark, 1978. Gift of Audrey Clark, 2014

1.2.2 Portable prototype blood-glucose meter
Designed and made by Stan Clark, 1979–88. Gift of Audrey Clark, 2014

1.2.3 Omniscan blood-glucose meter
Designed and made by Stan Clark, 1979–88. Gift of Audrey Clark, 2014

1.2.4 Diatron blood-glucose meter
Designed and made by Stan Clark, 1979–88. Gift of Audrey Clark, 2014

1.2.5 Easytest-2 blood-glucose meter
Designed and made by Stan Clark, 1979–88. Gift of Audrey Clark, 2014

1.2.6 Betachek G5 blood-glucose monitor
Designed by Nielsen Design Associates and BCS Electronic Design, 2000–03. Made by National Diagnostics Products, 2004. Gift of BCS Electronic Design, 2004

1.2.7 Accu-Chek Active blood-glucose monitor
Made by Roche Diagnostics, Germany, 2003. Gift of Roche Diagnostics Australia, makers of Accu-Chek products, 2006

---

## MicroRapid

The MicroRapid is an improved version of the lateral flow diagnostic test. The original design was revised after a study revealed that doctors using the test had trouble with the complex blood-sampling technique. Seeking to replicate lab accuracy in field clinics, designers from IDE Group and engineers from Atomo Diagnostics worked to integrate each step into a single device. They developed an intuitive design that allows only the correct testing sequence to occur, while making the device easier to use.

1.3.1 MicroRapid first prototype
Designed and made by Atomo Diagnostics and IDE Group, 2013

1.3.2 MicroRapid second prototype
Designed and made by Atomo Diagnostics and IDE Group, 2013

1.3.3 MicroRapid third prototype
Designed and made by Atomo Diagnostics and IDE Group, 2013

1.3.4 MicroRapid fourth prototype
Designed and made by Atomo Diagnostics and IDE Group, 2013

1.3.5 MicroRapid fifth prototype
Designed and made by Atomo Diagnostics and IDE Group, 2013

1.3.6 MicroRapid sixth prototype
Designed and made by Atomo Diagnostics and IDE Group, 2013

1.3.7 MicroRapid protoype with safety cap removed
Designed and made by Atomo Diagnostics and IDE Group, 2013

1.3.8 MicroRapid prototype in testing position
Designed and made by Atomo Diagnostics and IDE Group, 2013

Above prototypes gifts of John Kelly (Atomo Diagnostics Pty Ltd), 2014

1.3.9 Atomo HIV Self Test
Designed and made by Atomo Diagnostics and IDE Group, 2020. Purchased 2020

---

1.4.1 Haemodialysis machine
Made by Drake-Willock, 1967. Gift of Peter Morris, 1989

This was the first haemodialysis machine used in Australia. Prior to its invention, patients with kidney failure were required to attend hospital four hours, three times a week, for dialysis treatment. Today, many patients have an option to manage haemodialysis, which cleans the blood, at home or any other clean location.

---

1.5.1 hemaPEN and packaging
Designed by Design + Industry, 2019. Made by Trajan, 2020. Lent by Design + Industry

Blood samples are essential to medical diagnostics. However, traditional blood sampling methods are not always easy to access in remote areas. The hemaPEN is a microsampling tool that allows healthcare workers to draw blood and mail dried samples directly to a laboratory for analysis. It overcomes issues with dried blood sampling by delivering the blood to the sample paper inside the device, protecting it from potential contamination.

1.5.2 Exploded Xprecia Stride™ Coagulation Analyser
Designed by Design + Industry, 2013. Made by Siemens, 2015. Lent by Design + Industry

Xprecia Stride™ Coagulation Analyser
Designed by Design + Industry, 2013. Made by Siemens, 2020. Lent by Siemens Australia

A PT/INR test monitors the blood's ability to regulate clotting, the body's natural response to bleeding. The Xprecia Stride™ Coagulation Analyser offers the same reliability as a laboratory-run PT/INR test in a device the size of a smartphone. Designed for health settings that demand fast and accurate testing, the device combines a barcode scanner for easy data capture, an ejector for safe disposal of test strips and colour-coded caps to assist with use.

Bloodletting, cutting the skin or applying leeches to drain blood, was a common procedure performed by surgeons for almost 2000 years. Today, leeches are still used in surgery to draw blood, heal skin grafts and restore circulation.

---

1.6.1 Bleeding and lancing instruments
Maker unknown, China, about 1925. Gift of Asian Studies Department, University of Sydney, 1996

---

1.6.2 Lancing and scraping instruments
Maker unknown, China, about 1925. Gift of Asian Studies Department, University of Sydney, 1996

---

1.6.3 Medical instruments
Maker unknown, China, about 1925. Gift of Asian Studies Department, University of Sydney, 1996

---

1.6.4 Medical instruments
Maker unknown, China, about 1925. Gift of Asian Studies Department, University of Sydney, 1996

1.6.5 Scraping instruments
Maker unknown, China, about 1925. Gift of Asian Studies Department, University of Sydney, 1996

---

1.6.6 Medical instruments
Maker unknown, China, about 1925. Gift of Asian Studies Department, University of Sydney, 1996

---

1.6.7 Medical instruments
Maker unknown, China, about 1925. Gift of Asian Studies Department, University of Sydney, 1996

---

1.7.1 Bowl from Chinese medicine chest
Maker unknown, China, about 1925. Gift of Asian Studies Department, University of Sydney, 1996

1.7.2 Bowl from Chinese medicine chest
Maker unknown, China, about 1925. Gift of Asian Studies Department, University of Sydney, 1996

1.7.3 Bowl from Chinese medicine chest
Maker unknown, China, about 1925. Gift of Asian Studies Department, University of Sydney, 1996

1.7.4 Barber surgeons bowl
Maker unknown, France,
1770–1800. Gift of Christian R
Thornett, 1966

1.7.5 Bloodletting bowl
Maker unknown, possibly
made in Persia, about 1900.
Purchased 1973

1.7.6 Apothecary jar for holding
medicinal leeches
Made by S Maw and Son,
London, 1860–70. Gift of
Harold Jones, 1957

1.7.7 Apothecary jar for holding
medicinal honey
Made by S Maw and Son,
London, 1860–70. Gift of
Harold Jones, 1957

# 2.0.0 Heart and Monitoring

**The heart is a mass of muscular tissue that operates as a pump for our circulatory system, transporting blood throughout the body. Since the early 1800s, the monitoring of human and foetal heartbeats has been assisted with a stethoscope, a key development in medical product design. Over the last century, a global increase in heart failure has prompted medical researchers, engineers and designers to develop lifesaving equipment and devices that can control abnormal heart rhythms and provide mechanical support.**

---

The design of the stethoscope has remained largely unchanged since 1816 when French physician René Laennec, uncomfortable with placing his ear on a female patient's chest, rolled a paper tube to funnel the sound of her heartbeat.

---

2.1.1 Monaural stethoscope, trumpet
Maker unknown, 1850–1960.
Gift of Dr Bryan Gandevia, 2001

2.1.2 Monaural stethoscope, cone
Maker unknown, 1850–1960.
Gift of Dr Bryan Gandevia, 2001

---

2.1.3 Monaural stethoscope, cone
Maker unknown, 1850–1960.
Gift of Dr Bryan Gandevia, 2001

2.1.4 Monaural stethoscope, trumpet
Maker unknown, 1850–1960.
Gift of Dr Bryan Gandevia, 2001

---

2.1.5 Monaural stethoscope, trumpet
Maker unknown, 1850–1960.
Gift of Dr Bryan Gandevia, 2001

2.1.6 Monaural stethoscope, trumpet
Maker unknown, 1850–1960.
Gift of Dr Bryan Gandevia, 2001

---

2.1.7 Monaural stethoscope, trumpet
Maker unknown, 1850–1960.
Gift of Dr Bryan Gandevia, 2001

2.1.8 Monaural stethoscope, cone
Maker unknown, 1850–1960.
Gift of Dr Bryan Gandevia, 2001

---

2.1.9 Monaural stethoscope, trumpet
Maker unknown, 1850–1960.
Gift of Dr Bryan Gandevia, 2001

2.1.10 Monaural stethoscope, cone
Maker unknown, 1850–1960.
Gift of Dr Bryan Gandevia, 2001

---

2.1.11 Monaural stethoscope, trumpet
Maker unknown, 1850–1960.
Gift of Dr Bryan Gandevia, 2001

2.1.12 Monaural stethoscope, trumpet
Maker unknown, 1850–1960.
Gift of Dr Bryan Gandevia, 2001

---

2.1.13 Monaural stethoscope, trumpet
Maker unknown, 1850–1960.
Gift of Dr Bryan Gandevia, 2001

---

2.1.14 Monaural stethoscope, trumpet
Maker unknown, 1850–1960.
Gift of Dr Bryan Gandevia, 2001

2.1.15 Monaural stethoscope, trumpet
Maker unknown, 1850–1960.
Gift of Dr Bryan Gandevia, 2001

---

2.1.16 Binaural phonendoscope
Maker unknown, 1900–25.
Purchased 1987

---

2.1.17 Binaural stethoscope
Made by Eshmann, 1945–60.
Gift of Dr Bryan Gandevia, 2001

---

2.1.18 Grey stethoscope
Made by Surgico Pty Ltd, 1987.
Purchased 1987

---

2.1.19 Black stethoscope
Made by Surgico Pty Ltd, 1987.
Purchased 1987

---

2.1.20 Electronic stethoscope
Made by Yamasu, 1987.
Purchased 1987

---

## The Telectronics pacemaker

Founded in 1963, Australian manufacturer Telectronics made significant discoveries that shaped the modern design of the pacemaker, which assists in controlling heart rhythm. Experiments with lithium cell batteries, and the inclusion of custom

circuits and a titanium finish that prevents water access led to the release of the model 120 pacemaker in 1974. Today almost 15,000 pacemakers are implanted across Australia each year, with recent interations exploring leadless designs and modular components to meet individual need.

---

2.2.1 External cardiac pacemaker, model PX2
Designed and made by Telectronics, 1970. Gift of Telectronics Pty Ltd, 2005

---

2.2.2 External cardiac pacemaker, model TX6-C
Designed and made by Telectronics, 1990. Gift of Telectronics Pty Ltd, 2005

---

2.2.3 Tachyarrhythmia control pacer
Designed and made by Telectronics, 1990. Gift of Telectronics Pty Ltd, 2005

---

2.2.4 Cardiac pacemaker pulse analyser, model 230
Designed and made by Telectronics, 1985–95. Gift of Telectronics Pty Ltd, 2005

2.2.5 Telemetric programmer for cardiac pacemakers, model 5603
Designed and made by Telectronics, 1995. Gift of Telectronics Pty Ltd, 2005

---

2.2.6 Cardiac pacemaker, model P4
Designed and made by Telectronics, 1965. Gift of Telectronics Pty Ltd, 2005

---

2.2.7 Cardiac pacemaker, model P6
Designed and made by Telectronics, 1968. Gift of Telectronics Pty Ltd, 2005

---

2.2.8 Cardiac pacemaker, model P10
Designed and made by Telectronics, 1973. Gift of Telectronics Pty Ltd, 2005

---

2.2.9 Cardiac pacemaker, model 120
Designed and made by Telectronics, 1974. Gift of Telectronics Pty Ltd, 2005

---

2.2.10 Cardiac pacemaker, model 160B
Designed and made by Telectronics, 1977. Gift of Telectronics Pty Ltd, 2005

2.2.11 Cardiac pacemaker, Meta MV model 1202
Designed and made by Telectronics, 1987–88. Gift of Telectronics Pty Ltd, 2005

---

2.3.1 UI Octoson
Designed by the Ultrasonics Institute, 1960s. Made by Ausonics. Gift of the Royal Hospital for Women, 1997

This ultrasound system combined the detailed scanning of greyscale imaging with a reduced imaging time of one second. This allowed ultrasound to replace harmful X-rays as a way of monitoring a foetal heartbeat in the womb.

---

2.4.1 Signos Personal Ultrasound
Designed by Design + Industry, 2009–10. Made by Signostics Pty Ltd. Gift of Signostics Ltd, 2011

Used to view and monitor the inside of the body, ultrasound machines are typically large in scale and require multiple piezoelectric crystals that emit and detect ultrasound waves. This limits their availability in remote and regional areas. The Signos Personal Ultrasound requires only one piezoelectric crystal to form high resolution images on the attached screen, and is designed to be light, portable and accessible.

2.4.2 CliniCloud stethoscope and thermometer
Designed by Design + Industry, 2014. Developed by Andrew Lin and Hon Weng Chong. Made by CliniCloud, 2019. Lent by Design + Industry

With the emergence of online healthcare, new digitally connected diagnosis tools are needed. Supported by a mobile app and bluetooth connectivity, the CliniCloud stethoscope and thermometer guides users through the correct placement of sensors for accurate reading, stores a history of readings and supports multiple profiles. The cord can connect to a mobile's headphone jack to ensure high-quality lossless audio for heartbeat readings.

---

In order to function our organs require oxygen, which is distributed throughout our body by blood. Our heartbeat controls our blood circulation, and poor circulation can cause damage to our body over time.

---

2.5.1 VentrAssist left ventricular assist device, implantable blood pump with control box
Designed by Faculty of Engineering, University of Technology, Sydney, and Ventracor Ltd, 1997–99. Made by Ventracor Ltd, 2006. Gift of Ventracor Ltd, 2008

2.5.2 Wearable heart rate monitor
Designed and made by Polar Electro, 2001. Gift of Pursuit Performance, 2003

---

2.5.3 SphygmoCor XCEL blood pressure measurement device
Designed by 4DESIGN, 2012. Made by AtCor Medical Pty Ltd, 2012. Gift of Lawrence Chan, AtCor Medical Pty Ltd, 2013

---

More than 30,000 Australians suffer a cardiac arrest each year. A defibrillator can restart the heart or shock it back into its correct rhythm, returning control to its natural pacemaker cells.

2.6.1 Printed surgical heart models
Designed by Dr James Otton, 2016. Used by Victor Chang Cardiac Research Institute, 2016. Gifts of Victor Chang Cardiac Research Institute, 2017

2.6.2 Advertising booklet for Guardian implantable defibrillator and pacemaker systems
Designed and made by Telectronics Pty Ltd, 1990. Gift of Telectronics Pty Ltd, 2005

2.6.3 Guardian defibrillator, model 4201
Designed and made by Telectronics Pty Ltd, 1987. Gift of Telectronics, 1988

2.6.4 Sentry cardiovascular defibrillator, dummy for testing purposes
Designed and made by Telectronics Pty Ltd, 1990–95. Gift of Telectronics Pty Ltd, 2005

2.6.5 *Your New Lease on Life*, booklet about living with a pacemaker
Designed and made by Telectronics Pty Ltd, about 1985. Gift of Telectronics Pty Ltd, 2005

2.6.6 Guardian defibrillator support device, no 4501
Designed and made by Telectronics Pty Ltd, about 1988. Gift of Telectronics Pty Ltd, 2005

# 3.0.0 Breath and Resuscitation

**Not only does our breath bring oxygen into our body, breathing can also help reduce stress, improve endurance and affect our overall health. Respiratory illnesses have been prevalent throughout history and we have long sought to understand the relationship between the blood, heart and lungs. With the backdrop of a global pandemic, our relationship with our breath has intensified. Our increased understanding of the human body's interconnected respiratory system has allowed us to design highly customised support devices, such as ventilators, masks and respirators.**

---

The first recorded use of a surgical face mask was in 1897. Today, our understanding of disease and toxic particles has influenced the design of face masks, which are engineered to respond to a range of airborne risks and communicable diseases.

3.1.1 Anti-gas respirator
Made by Willow Manufacturing Co, 1942. Ex-museum stock, 1982

3.1.2 Civilian respirator
Made by Avon, about 1940. Gift of Watson, Capt T F, 1946

3.1.3 Comfo cushion respirator and filters
Designed and made by MSA Australia, 1987. Purchased 1987

3.1.4 Half-piece reusable respirator
Made by 3M Australia, 1997–2000. Gift of 3M Australia, 2000

3.1.5 Disposable unvalved particulate respirator
Made by 3M Australia, 1997–2000. Gift of 3M Australia, 2000

3.1.6 Disposable valved cupped respirator
Made by 3M Australia, 1997–2000. Gift of 3M Australia, 2000

3.1.7 Disposable valved flat-fold respirator
Made by 3M Australia, 1997–2000. Gift of 3M Australia, 2000

3.1.8 AusAir Mask
Made by AusAir, 2020.
Lent by AusAir

---

Continuous Positive Airways Pressure (CPAP) machines

Sleep apnea is a commonly undiagnosed disease that affects many adults over 30. CPAP machines provide relief during sleep by blowing pressurised air into the airways through the use of a mask that covers the nostrils, or mouth and nose. A tight seal is needed between the mask and the face to maintain the pressurised air. While the first CPAP prototypes relied on glue to create a seal around the nostrils, today's CPAP masks are designed for both comfort and function.

3.2.1 Sullivan Nasal CPAP System and Face Mask, model APD-1
Designed by Colin E Sullivan.
Made by ResCare Ltd, 1991.
Gift of ResCare Limited, 1995

3.2.2 AutoSet Spirit flow and Mirage Activa Mask
Designed and made by ResMed, 2002–04. Gift of ResMed Australia, 2006

3.2.3 ResMed AirSense 10 Automatic Positive Airway Pressure Machine and AirFit F20 Mask
Designed and made by ResMed, 2014–20. Gift of ResMed Australia, 2020

3.3.1 Artificial respirator
Designed and made by Both Equipment Ltd, 1955. Gift of Royal North Shore Hospital, 1991

Designed by Australian inventors Edward and Donald Both during the polio epidemic in 1937, this was the world's first portable respirator. It assisted patients to breathe when their respiratory muscles had been paralysed. This 'portable' respirator was a significant improvement to the large tank ventilator known as the Drinker iron lung.

---

3.4.1 AirMini and the P10 mask system
Designed and made by ResMed, 2017–20. Gifts of ResMed Australia, 2020

As the smallest CPAP ventilator on the market, the AirMini helps people to breathe when their airways are obstructed. To achieve this compact size, ResMed has incorporated a small three-stage fan overcoming fan burnout and noise, a specially designed vent that releases carbon dioxide while maintaining a low airflow, and a waterless humidification system. The AirMini can be used in compatible masks, such as the AirFit P10.

3.4.2 Nose Studio® and the ApneaSeal Mask
Designed by Design + Industry and Bespoke Medical Innovations, 2015–17. Made by Bespoke Medical Innovations, 2017. Lent by Bespoke Medical Innovations

As part of its innovative 3D face-mapping technology, Nose Studio® captures over 20,000 data points from the nose and face. A precise facial profile is created from which a custom mask is produced. As each person has a unique facial structure, these masks optimise fit for an individual's features, improving on the design of traditional sleep apnea masks, which assist with breathing difficulties during sleep.

---

From the 1950s, portable handheld inhalers that deliver medication to the lungs have been used as a common treatment for asthma. Since then, significant changes to the design have accommodated new propellants that make inhalers easier to use.

3.5.1 Asthma Remedy
Made by Dr J D Kellogg's, late 1800s. Purchased 1985

3.5.2 Sports-haler
Designed and made by DelvTech International, 2008. Gift of DelvTech International, 2010

3.5.3 Medihaler-Iso
Designed and made by 3M Industries, 1970–95. Gift of 3M Australia, 2020

3.5.4 Airomir
Designed and made by 3M Industries, 1995. Gift of 3M Australia, 2020

---

Influenza is a common viral infection that mutates each year and is managed through a combination of vaccines and medication. Meticulously designed public communication around preventative measures also plays a key role in controlling its spread.

---

3.6.1 Influenza badge
Made by Angus & Coote Australia, about 1919. Purchased 1993

---

3.6.2 Surgical mask
Maker unknown, probably 1930–50. Gift of Mrs Marianne van de Voorde, 2004

---

3.6.3 Surgical mask and packaging
Made by Panda Brand, 1965–79. Purchased 1998

3.6.4 Influenza virus vaccine pamphlets
Printed by Harris-Williams Press Pty Ltd. Published by Commonwealth Serum Laboratories, 1958–59. Gift of Dr Vivian George Balmer, 2007

---

3.6.5 FLU OIA
Designed by Biota Holdings, 1998. Made by Thermo Electron Corporation, 2004. Gift of Biota Holdings, 2004

---

3.6.6 Relenza (Zanamivir) influenza treatment drug kit
Made by GlaxoSmithKline Australia Pty Ltd, 2004. Gift of Biota Holdings, 2005

---

Tuberculosis is an infection caused by bacteria that spreads through the air. Medical apparatus that were designed to manually collapse the lung were believed to cure the disease, before the discovery of antibiotics in the 1940s.

3.7.1 Compulsory tuberculosis chest X-ray notifications
About 1970. Gift of the estate of Dr W R C Bennett, 2006

3.7.2 Artificial pneumoperitoneum apparatus
Made by Genito-Urinary Manufacturing Co Ltd, 1910–50. Gift of Dr Bryan Gandevia, 2001

3.7.3 Artificial pneumoperitoneum apparatus
Made by Genito-Urinary Manufacturing Co Ltd, 1910–50. Gift of Dr Bryan Gandevia, 2001

3.7.4 Artificial pneumothorax apparatus
Various makers, 1910–50. Gift of Dr Bryan Gandevia, 2001

# 4.0.0 Medicine and Drugs

**Recent developments in medicine and drugs have allowed us to respond to diseases that have plagued us for millennia, as the administration of medicine supercedes injections made by using syringes or hypodermic needles. Today, complex medications are designed to exploit weaknesses in bacteria, viruses and cancers. The safe use of pharmaceuticals is assisted by designers with specialist knowledge in user experience and visual communication.**

---

Pharmaceutical packaging design was largely unregulated until the 1960s, when safety and efficacy data guidelines were first introduced. As information and text became more prevalent on prescription drug packaging, many designers working in the medical sector adopted the simple typographic approach of the Swiss design style.

---

4.1.1 Gynergen
Manufactured by Sandos, Switzerland, 1967. Gift of A N Davies, 2018

4.1.2 Adrenaline in oil
Manufactured by Parke David & Co Ltd, Australia, 1967. Gift of A N Davies, 2018

---

4.1.3 Stemetil
Manufactured by May & Baker Ltd, Australia, 1967. Used by Dr Bruce C Terrey, 1967. Gift of A N Davies, 2018

4.1.4 Bronkephrine
Manufactured by Winthrop Laboratories, Australia, 1967. Gift of A N Davies, 2018

---

4.1.5 Hypodermic needles
Made by Acufirm, Germany, 1967. Gift of A N Davies, 2018

4.1.6 Bronkephrine
Manufactured by Winthrop Laboratories, Australia, 1967. Gift of A N Davies, 2018

---

4.1.7 Braun instant sutures
Made by Braun, Germany, 1967. Distributed by Will Pearce & Co Pty Ltd, Sydney, 1967. Gift of A N Davies, 2018

4.1.8 Bronkephrine
Manufactured by Winthrop Laboratories, Australia, 1967. Gift of A N Davies, 2018

4.1.9 Hypodermic needles
Manufactured by Unimed, Switzerland, 1967. Gift of A N Davies, 2018

4.1.10 Phenobarbitone sodium
Manufactured by Baxter-DHA Laboratories Pty Ltd, Australia, 1967. Gift of A N Davies, 2018

---

4.1.11 Lasix
Manufactured by Hoechst Pharmaceuticals Pty Ltd, Germany, 1967. Gift of A N Davies, 2018

4.1.12 Heparin Injection BP
Manufactured by Commonwealth Serum Laboratories, Australia, 1967. Gift of A N Davies, 2018

---

4.1.13 Lasix
Manufactured by Hoechst Pharmaceuticals Pty Ltd, Germany, 1967. Gift of A N Davies, 2018

4.1.14 Torecan
Manufactured by Sandoz Ltd, Switzerland, 1967. Gift of A N Davies, 2018

---

4.1.15 Morphine sulphate injection BP
Manufactured by Baxter-DHA Laboratories Pty Ltd, Australia, 1967. Gift of A N Davies, 2018

4.1.16 Stemetil
Manufactured by May & Baker Ltd, Australia, 1967. Used by Dr Bruce C Terrey, 1967. Gift of A N Davies, 2018

---

4.1.17 Coramine
Manufactured by CIBA Brand, Switzerland, 1967. Gift of A N Davies, 2018

4.1.18 Sparine
Made by Wyeth, USA, 1967. Gift of A N Davies, 2018

---

4.1.19 Pethoid
Manufactured by Burroughs Wellcome & Co, Australia, 1967. Gift of A N Davies, 2018

4.1.20 Morphine and Atropine sulphate injection
Manufactured by Baxter-DHA Laboratories Pty Ltd, Australia, 1967. Gift of A N Davies, 2018

---

4.1.21 Largactil
Made by May & Baker Ltd, Australia, 1967. Gift of A N Davies, 2018

4.1.22 Banistyl
Made by May & Baker Ltd, Australia, 1967. Gift of A N Davies, 2018

4.1.23 Largactil
Made by May & Baker Ltd, Australia, 1967. Gift of A N Davies, 2018

4.1.24 Largactil
Made by May & Baker Ltd, Australia, 1967. Gift of A N Davies, 2018

---

4.1.25 Adrenaline Tartrate Injection
Manufactured by Parke David & Co Ltd, Australia, 1967. Gift of A N Davies, 2018

4.1.26 Alupent
Made by Boehringer Ingelheim, Australia, 1967. Gift of A N Davies, 2018

---

4.1.27 Labstix Reagent Strips
Manufactured by Ames, USA, 1967. Gift of A N Davies, 2018

4.1.28 Braun instant sutures
Made by Braun, Germany, 1967. Distributed by Will Pearce & Co Pty Ltd, Sydney, 1967. Gift of A N Davies, 2018

---

4.1.29 Doriden
Made by CIBA, Switzerland, 1967. Used by Dr Bruce C Terrey, 1967. Gift of A N Davies, 2018

4.1.30 Solu-Cortef
Made by Upjohn, 1967. Used by Dr Bruce C Terrey, 1967. Gift of A N Davies, 2018

4.1.31 Butisol
Made by Ethnor Pty Ltd, Australia, 1967. Used by Dr Bruce C Terrey, 1967. Gift of A N Davies, 2018

4.1.32 Cicatrin cream
Made by Calmic Limited, Australia, 1967. Gift of A N Davies, 2018

---

4.1.33 Prescription forms
Made by Commonwealth of Australia, Repatriation Department, 1967. Used by Dr Bruce C Terrey, 1967. Gift of A N Davies, 2018

4.1.34 Memorandum of fees
Made in Australia, 1967. Used by Dr Bruce C Terrey, 1967. Gift of A N Davies, 2018

---

4.1.35 Medical service vouchers
Made by Commonwealth of Australia  Repatriation Department, 1967. Used by Dr Bruce C Terrey, 1967. Gift of A N Davies, 2018

4.1.36 Medical service vouchers
Made by Commonwealth of Australia, Department of Health, 1967. Used by Dr Bruce C Terrey, 1967. Gift of A N Davies, 2018

Ambulatory Drug Infusion Pump

Originally designed to deliver insulin, this infusion pump was adapted for drug delivery. Its success with medications, such as morphine, is due to patented technology that allows the device to control the amount of medication delivered to the user. This ensures that the patient is able to administer their own medication without any risk of overdose.

---

4.2.1 First working prototype
Made by Bionica Pty Ltd, 1984–86. Gift of Bionica Pty Ltd, 1993

---

4.2.2 Second working prototype
Made by Bionica Pty Ltd, about 1986. Gift of Bionica Pty Ltd, 1993

---

4.2.3 Third working prototype
Made by Bionica Pty Ltd, about 1986. Gift of Bionica Pty Ltd, 1993

---

4.2.4 First injection moulded case
Made by Bionica Pty Ltd, about 1986. Gift of Bionica Pty Ltd, 1993

---

4.2.5 Demonstration model
Made by Bionica Pty Ltd, 1986–92. Gift of Bionica Pty Ltd, 1993

4.2.6 Non-working model with US modifications
Made by Bionica Pty Ltd, 1992. Gift of Bionica Pty Ltd, 1993

---

4.3.1 Storpedoette
Made by Australian Red Cross, 1950–57. Gift of the Australian Red Cross Blood Service, 2015

Adapted from the Storpedo used in World War II (1939–45), the Storpedoette delivered blood and other medical supplies to remote areas during the 1950s. The container was designed to be dropped from a small plane.

---

4.4.1 RASTRUM 3D Bioprinter
Designed by Design + Industry and Inventia Life Sciences, 2013–18. Made by Inventia Life Sciences, Australia, 2020. Lent by Inventia Life Sciences

3D cell models mimic human tissue to help scientists understand and treat diseases. Bioprinters, like the RASTRUM, allow these cell structures to be reproduced quickly and accurately. The RASTRUM's innovative self-cleaning design allows cells and the surrounding matrix (supporting structure) to be printed simultaneously. This could lead to faster and more successful drug discovery, printing of tissue for transplant and even personalised medicines.

The hypodermic needle is capable of injecting medication below the skin and is made from a hollow needle attached to a syringe. The disposable syringe was invented in the 1950s and its use is widespread today.

4.5.1 Record hypodermic syringe
Made by Ogden Industries Pty Ltd, possibly 1950–60. Gift of John Fairfax, 1985

4.5.2 Vaginal syringes
Made by Tubeglass Products Co, 1925–35. Purchased 1984

4.5.3 Penicillin ampoules
Made by Commonwealth Serum Laboratories, 1944. Gift of Commonwealth Serum Laboratories, 1987

4.5.4 Glass hypodermic syringe
Maker unknown, about 1940–60. Gift of Mr Patrick Marco, 2006

4.5.5 Fitpack syringe kit with syringes
Designed by Ruth McDermott and Steve Ward, 1989. Made by ASP Plastics and Terumo (Australia) Pty Ltd for the NSW Department of Health, 1990–91. Gift of NSW Department of Health AIDS Bureau and McDermott Ward Pty Ltd, 1991

4.5.6 OMI retractable syringes
Designed by Bruce Kiehne for Occupational & Medical Innovations, 1996–2001. Manufactured by China Medical Group, 2004. Gift of Occupational and Medical Innovations Ltd, 2004

4.5.7 Polyethylene and polypropylene disposable syringe
Designed by Harry Willis, 1949–51. Made by Charles Rothauser, Industrial Products Limited, 1949–51. Gift of Charles Rothauser AO, 1995

4.5.8 Glass syringes
Maker and date unknown. Used by Dr Bruce C Terrey, 1967. Gift of A N Davies, 2018

4.5.9 Hypodermic syringe in case
Made by Faro, Italy, 1920–40. Gift of Mrs Pat Bradshaw, 2003

4.5.10 Bifurcated needles for smallpox vaccination
Developed by World Health Organisation, 1960–80. Gift of Department of Public Health, University of Sydney, 1990

---

Throughout history, humans have ingested medicinal tonics in search of a cure for disease. As our knowledge of the body has advanced, so too has our capacity to treat and medicate, enlisting specialist technologies.

---

4.6.1 The improved Queen Mab vaporising lamp
Maker unknown, about 1910. Gift of the Royal Australian Historical Society, 1981

4.6.2 Pharmacy containers
Maker unknown, about 1925. Gift of Asian Studies Department, University of Sydney, 1996

---

4.6.3 Insufflators
Maker unknown, about 1925. Gift of Asian Studies Department, University of Sydney, 1996

---

4.6.4 Opium pipe
Maker unknown, 1960–80. Gift of Dr Bryan Gandevia, 2001

---

4.6.5 Drug injection device
Made by PowderJect Pharmaceuticals, 1997. Gift of PowderJect Pharmaceuticals PLC, 1997

---

4.6.6 ReCell Spray-On Skin Kit
Made by Avita Medical Ltd, 2013. Gift of Avita Medical Ltd, 2013

---

4.6.7 TIMERTAG Reusable IV Alert
Designed by Design + Industry, 2013. Made by Senver, 2019. Lent by Design + Industry

# 5.0.0 Modification and Augmentation

**For centuries, injury, disease and congenital disorders necessitated the modification of the human body. Today, scientists, researchers and designers are focused on extending our biological capabilities, by pushing the human body to new limits. With advances in prosthetic technologies, surgery and the manipulation of genetic material, it is now possible to redesign our bodies to achieve healthier, longer lives.**

---

Responses in the human body after surgery, such as swelling, can hinder the healing process. Designed to reduce swelling, surgical supports provide firm pressure across the site of operation and can aid in a patient's recovery.

---

5.1.1 Leg traction surgical support
Made by S H Camp & Co, 1955. Gift of Berlei Hestia Industries Ltd, 1993

5.1.2 Mens surgical support, rib belt
Made by S H Camp & Co, about 1955. Gift of Berlei Hestia Industries Ltd, 1993

---

5.1.3 Surgical support belt, Lewin Belt
Made by S H Camp & Co, 1956. Gift of Berlei Hestia Industries Ltd, 1993

5.1.4 Mens colostomy belt
Made by S H Camp & Co Ltd, 1957–58. Gift of Berlei Hestia Industries Ltd, 1993

---

5.1.5 Lymphoedema arm sleeve
Made by S H Camp & Co, 1957. Gift of Berlei Hestia Industries Ltd, 1993

---

5.1.6 Victoria Collar neck brace
Made by S H Camp & Co, 1959. Gift of Berlei Hestia Industries Ltd, 1993

5.1.7 Womens surgical support
Made by S H Camp & Co, about 1960. Gift of Berlei Hestia Industries Ltd, 1993

---

5.1.8 Jarco pelvic traction belt
Made by S H Camp & Co, 1961. Gift of Berlei Hestia Industries Ltd, 1993

5.1.9 Brace insert for lumbosacral support
Made by S H Camp & Co, 1963. Gift of Berlei Hestia Industries Ltd, 1993

---

Cochlear implant

Sound is converted into electrochemical signals through hairs in the cochlea, a cavity in our inner ear. If these hairs are damaged, so too is our hearing. Australian doctor Professor Graeme Clark invented the first multichannel implant that stimulates the cochlea with tiny electrodes. Due to improvements in electronics, the size of a cochlear implant has reduced, along with its speech processor. Medical company Cochlear Limited, along with partners like Design + Industry, are continuing to develop their design, allowing users to take their hearing device anywhere, including swimming.

---

5.2.1 Gold Box, prototype implant and speech processor
Designed and made at the University of Melbourne Department of Ear, Nose and Throat Surgery, 1979–80. Gift of Professor Graeme Clark and the University of Melbourne, 2011

---

5.2.2 Cochlear implant, speech processor and headset microphone
Made by Nucleus Ltd, 1983. Purchased 1986

5.2.3 Demonstration cochlear implant
Made by Cochlear Limited, 1987. Gift of Cochlear Limited, 1989

---

5.2.4 Model of Nucleus Freedom
Made by Cochlear Limited, 2003–04. Gift of Cochlear Limited, 2007

---

5.2.5 Nucleus Freedom
Made by Cochlear Limited, 2005. Gift of Cochlear Limited, 2007

---

5.2.6 Cochlear™ Nucleus® 7 Sound Processor in Aqua+ waterproof sleeve
Made by Cochlear Limited, 2017–20. Sleeve co-designed by Cochlear and Design + Industry, 2015. Lent by Cochlear Limited

Facett hearing aid

Facett is the world's first self-fit modular hearing aid, enabling users to fine-tune their settings through a mobile app. Facett was developed by Melbourne-based designer Dr Leah Heiss for Blamey Saunders hears after she was inspired by the Museums Victoria mineralogy collection. Heiss and her team generated more than 150 hearing-aid and 50 case models to test the design and user experience. Facett relies on magnetic connectors, bypassing the need to change tiny batteries, a difficult task for people with reduced dexterity or vision.

---

5.3.1 Facett iterative charger models
Designed by Leah Heiss for Blamey Saunders hears, 2016. Lent by Leah Heiss and Blamey Saunders hears

5.3.2 Facett iterative hearing aid models
Designed by Leah Heiss for Blamey Saunders hears, 2016. Lent by Leah Heiss and Blamey Saunders hears

---

5.3.3 Facett modular hearing aid
Designed by Dr Leah Heiss, 2018. Made by Blamey Saunders Hears, 2018. Lent by Leah Heiss and Blamey Saunders hears

5.4.1 Carbon laser machine
Made by Laser Industries, 1979. Gift of Royal Prince Alfred Hospital, 1995

Used for surgery, carbon laser machines were some of the earliest gas lasers made. They remain the preferred choice for operation on soft tissues, as they can reduce bleeding, swelling and the risk of infection.

---

5.5.1 ExoFlex®
Designed by Design + Industry, 2016. Developed by Peter Abolfathi, 2013–16. Made by BES Rehab Ltd, 2017. Lent by Design + Industry

If a hand is paralysed or damaged after an accident, it requires targeted movement for exercise and recovery. The ExoFlex® hand therapy and assessment device is designed to fit the fingers that require support and can train each joint of a finger individually. Exercise can be managed by the device controlling, resisting or preventing joint movement. This allows a therapist to develop custom routines for each patient with the goal to restore hand functionality.

The DNA in our bodies stores unique genetic code that influences the way our cells function and grow. Editing our DNA may allow us to design more resilient humans in the future.

5.6.1 DNA Collection Kit
Made by Ancestry, 2018. Purchased with funds from the MAAS Foundation, 2018

5.6.2 Transformation Efficiency Kit and Linearised Plasmid Backbones
Made by iGEM Foundation, 2014. Gift of Macquarie University, 2015

5.6.3 Dried DNA samples
Made by iGEM Foundation, 2014. Gift of Macquarie University, 2015

---

Elective surgery to repair or replace a failing human organ is increasingly common. Innovative material technologies and scientific research have facilitated the production of artificial components that can replace organs or body parts damaged by disease, injury or ageing. These technologies have also given rise to biohacking and human augmentation.

---

5.7.1 Field surgical case
Maker unknown, Japan, 1935–45. Gift of Mr John Wright, 2000

5.7.2 Implantable bone growth stimulator
Made by Osteostim, Division of Telectronics Pty Ltd, 1975–80. Gift of Telectronics Pty Ltd, 2005

---

5.7.3 Monitor for implantable bone growth stimulator
Made by Osteostim, Division of Telectronics Pty Ltd, 1975–80. Gift of Telectronics Pty Ltd, 2005

---

5.7.4 Hip implant
Developed by Professor R L Huckstep, 1987–90. Gift of Professor Ronald Huckstep, 1990

---

5.7.5 Implantable LED light controllers
Designed and developed at Grindhouse Wetware, 2014–16. Gift of Livestock Labs, 2018

---

5.7.6 Intraocular lens
Made by Fred Hollows Intraocular lens Laboratory, 1993. Gift of the Fred Hollows Foundation, 1994

The design of artificial body parts, or prosthetics, has changed since World War I, in the early 1900s. New technologies such as 3D scanning and printing have enabled stronger prosthetics that can be customised.

---

5.8.1 Prosthetic arm with attachments
Maker unknown, 1920–40. Gift of Richard and Carol Dubois, 2004

---

5.8.2 Re-Flex Shock
Designed and made by Ossur, 2014. Gift of Ossur Asia Pacific, 2015

---

5.8.3 3D-printed skull implant
Designed and made by Anatomics, 2016. Gift of Anatomics, 2017