

Modern treatment of disease	The impact of war and technology on surgery	Modern public health
<p>Modern treatment of disease: the development of the pharmaceutical industry; penicillin, its discovery by Fleming, its development; new diseases and treatments, antibiotic resistance; alternative treatments.</p> <p>The key discovery in the twentieth century was the development of Penicillin; Alexander Fleming Penicillin was discovered by Alexander Fleming when he was tidying his laboratory and found a petri dish with a mould growing on it. Fleming saw that the mould had killed the bacteria around it. He tested it and worked out which bacteria it could kill. He wrote about his findings in a medical journal, but did not purify or mass produce it. Howard Florey and Ernst Chain Florey and Chain found a way of purifying penicillin. They trialled it on a policeman called Albert Alexander who had acquired an infection after scratching himself on a rose bush. The penicillin worked, and he showed signs of recovering until they ran out and Albert died. The American government saw the potential of Penicillin with the prospect of war and invested in research into Penicillin. This meant by the time D Day happened in 1944 there was enough Penicillin to treat all injured American personnel. Other developments The list of treatments that finally started to help people cure disease and health problems is a long one. Here are some of the main discoveries: The discovery of vitamins allowed doctors to prescribe vitamin supplements, which cured beriberi, rickets, pernicious anaemia and pellagra. In 1921 Banting and Best developed insulin. They could not cure diabetes, but they were able to alleviate its results. Today, doctors use hormone treatments to correct thyroid problems, help children grow, improve sexual performance and shrink cancers. The work of Peter Medawar (1950's: Britain) on immuno-suppressants led to the development of anti-histamine, which prevents allergies and operative shock. After the 1950's, doctors (through contraception) were able to prevent pregnancy, and after the 1970's (through IVF) to help childless women become pregnant (although side effects of the contraceptive pill are thromboses, migraine and jaundice). In 2005, a 66-year-old Romanian woman gave birth to twins. In the 1950's, doctors used the drug thalidomide to treat morning sickness during pregnancy. It caused terrible deformities in babies, but today is used in the treatment of AIDS, leprosy and some cancers. In 1954, Joseph Salk (America) discovered a polio vaccine, which helped eradicate polio from the western world in the 20th century, and which may make it extinct worldwide early in the 21st century.</p>	<p>The impact of war and technology on surgery: plastic surgery; blood transfusions; X-rays; transplant surgery; modern surgical methods, including lasers, radiation therapy and keyhole surgery.</p> <p>Surgeons in WW1 had the opportunity to experiment with new techniques. Surgeons developed techniques to repair broken bones, and perform skin grafts – plastic surgery. Surgery of the eye, ear, nose and throat all improved rapidly. X-rays were first discovered 20 years before the war. Hospitals installed X-ray machines, but it was the First World War which confirmed their importance. X-rays immediately improved the success rate of surgeons in removing deeply lodged bullets and shrapnel which would otherwise have caused fatal infections. During WW1 the following advances occurred:</p> <ul style="list-style-type: none">Scientists didn’t know about different blood groups. Blood groups were discovered in 1901 by Karl Landsteiner. The discovery made transfusions successful. During the First World War vast amounts of blood was needed. Many soldiers bled to death in the trenches before blood could get to them. The search began for a better method of storage and transfusion. Doctors discovered how blood can be bottled, packed in ice and stored where it was needed.The mental strain of war caused psychological damage. This was officially recognised and is now known as PTSD (post-traumatic stress disorder).Discovered in 1895, but during WW1 they first became important in locating where bullets or shrapnel had lodged in the soldier’s body.During WW1, Harold Gillies led development of plastic surgery. He could graft skin and treat men suffering from severe facial wounds.Through trial and error, surgeons worked out the best way to cut away infected flesh and soak the wound in salty solution during war.Innovations developed in the First World War had a massive impact on survival rates – such as the Thomas splint, named after pioneering Welsh surgeon Hugh Owen Thomas, which secured a broken leg. At the beginning of the war 80% of all soldiers with a broken femur died. By 1916, 80 % of soldiers with this injury survived.From January 1915 the British military medical machine moved closer to the front line. Casualty clearing stations were now better equipped and, crucially, more surgeons were closer to the battlefield. There were now fewer delays in administering potentially life-saving treatment. Soldiers with wounds that would have been fatal were now more likely to survive. <p>During WW2 the following developments took place:</p> <ul style="list-style-type: none">Progressed during WW2 as American surgeon Dwight Harken cut into beating hearts and used his bare hands to pull out bits of shrapnel and bullets.Doctor Archibald McIndoe further developed plastic surgery while avoiding infection by using penicillin.Shortages of food led to the government encouraging people to grow their own food, which led to a healthier diet all round.To keep Britain fit during WW2, a national immunisation programme against diphtheria was launched.Penicillin was massively developed during WW2During the war, Britain’s children were evacuated to the countryside and experienced healthier lifestyles, forcing the government to try to improve their lives when they returned to the towns.in 1942, William Beveridge suggested a National Health Service, paid for by tax and free to all. Straight after the war, this was introduced.Better anaesthetics allowed deeper surgery as patients could be kept asleep for longer. <p>There is no time when it is 'good' to become ill, but the 20th century was a much better time to be poorly than any previous period in history. By 1991, the average life expectancy of a man in Britain was 73, and of a woman, 78. Based on a string of spectacular scientific discoveries, doctors came to understand the human body like never before, for example:</p> <ul style="list-style-type: none">in the early 1900s, Willem Einthoven in Holland invented the electrocardiograph, or heart monitorin 1901, Karl Landsteiner in Austria discovered blood groupsin the 1930s, the discovery of penicillin by Chain and Florey, inspired by the work of Alexander Flemingin 1931, the electron microscope was developedin 1953, Francis Crick and James Watson in Britain discovered the molecular structure of DNAin 1953, Leroy Stevens in America discovered stem cellsin 1972, Godfrey Hounsfield in Britain invented the CAT scanner (a powerful X-ray machine that provides a cross-section of the human body)in the 1990s, the Human Genome project mapped all the 40,000 genes in the human bodyFor the first time in history, doctors were able to cure many diseases:the discovery of vitamins allowed doctors to cure diseases such as ricketsin 1922, the first clinical trials of injected insulin saved people with diabetesduring World War Two, Florey and Chain learned how to mass-produce the penicillin they had discovered - the first antibiotichowever, doctors were still unable to cure viruses such as AIDS or diseases like cancer, and overuse of antibiotics led to the development of drug-resistant strains of killer diseases such as the MRSA hospital 'superbug' <p>Surgery</p> <ul style="list-style-type: none">For the first time in history, people went into hospital not just expecting to be healed, but expecting to come out better than they went in. Key advances included:In the 1940s, the British surgeon, Archibald McIndoe, did the first plastic surgery on the faces of disfigured airmen. They were nicknamed the 'Guinea Pig Club'.In 1967, the South African surgeon, Christiaan Barnard, performed the first heart transplant.In 1978, Louise Brown became the first 'test-tube' baby.In the 1990s, 'keyhole' surgery, which avoided using large surgical cuts, became more widely used.	<p>During the Boer War of 1899 to 1902, the government discovered that half the volunteers for the army were unfit for service. In the 1900s, therefore, the Liberal government passed a string of welfare reforms based on 'the personal principle' – the belief that the government had a responsibility to care for the individual citizen:</p> <ul style="list-style-type: none">1906, local authorities were given the right to provide free school meals for poor children1907, the School Medical Service gave free health checks1908, the government introduced pensions for old people1911, the National Insurance Act provided free medical treatment for workers, and benefit money for those out of work <p>At the end of the 19th century, a number of investigations were carried out by wealthy businessmen, responding to concern that poverty was a national problem. Two important figures, Charles Booth and Seebohm Rowntree, sponsored major investigations into the extent and causes of poverty. The findings of both Booth and Rowntree identified key points:</p> <ul style="list-style-type: none">up to 30 per cent of the population of cities were living on or below the poverty line.people could not pull themselves out of poverty by themselvesBooth and Rowntree both identified the main causes of poverty as being illness and unemploymentage was also a major factor: both the very young and the old were most at risk of poverty1918: After the World War One, the British Prime Minister Lloyd George promised the soldiers returning from the battlegrounds of Europe 'homes fit for heroes'. The government set itself a target of building half-a-million decent homes by 1933.1919: A Ministry of Health was set up to look after sanitation, health care and disease, as well as the training of doctors, nurses and dentists, and maternity and children's welfare.1934: Although the economic depression of the 1930's caused government to cut back on spending, it passed the Free School Milk Act and encouraged local councils to give poor children free school meals.1942: During the World War Two, the need to give people something to fight for led the government to commission up the Beveridge Report. Beveridge recommended a Welfare State, which would provide social security, free health care, free education, council housing and full employment.1946: The New Towns Act planned new towns such as Stevenage and Newton Aycliffe to replace the inner-city slums. The Town and Country Planning Act of 1947 set a target of 300,000 new homes a year, and identified 'green belts' where housing would not be allowed to continue to swallow up the countryside.5 July 1948: The 'appointed day' for the start of the National Health Service. In 1948, the National Assistance Act, abolished the poor law and brought in social security1956: The Clean Air Act imposed smokeless zones in cities and reduced smog. <p>By 2001 the government provided or subsidised a huge array of services to:</p> <ul style="list-style-type: none">help with family planning, care for pregnant women and visit mothers with infantsprovide doctors and hospitals, dentists and opticians, diet and psychological caresupport old people in their homes, and provide care homes for those unable to look after themselves