



Medieval and Renaissance Medicine



Medieval Medicine

Christianity

Christians believed that illness was sent by God to punish people for their sins. Therefore, the sick could be healed if they prayed for forgiveness to Jesus Christ and the saints linked to particular illnesses. For example, St Apollonia was the patron saint of toothache because all her teeth had been knocked out when she was murdered because of her religion. In some hospitals, nuns fed the sick and gave them herbal remedies, but prayer was the most important treatment.

The Christian Church preserved a great deal of knowledge handed down from the Greeks and Romans. Monks in monasteries copied out the Bible, histories and other ancient books, including books by Galen and other medical writers from Greece and Rome.

Galen's books were the main books read by physicians in Europe for two reasons. Firstly, the Christian Church controlled the universities where physicians were trained and the Church believed that ancient writings should not be questioned. If people started questioning Galen they might question the Bible, so questioning was not a good idea! Secondly, the Church supported Galen because he said that each part of the body had a definite purpose. This fitted the Christian belief that God had created human beings. Therefore, when Roger Bacon said that doctors should do their own research instead of just reading Galen he was thrown into prison by church leaders.

Islam

The Islamic religion taught people to look after the sick and Arab hospitals were famous for the care they gave patients. The first was founded in Baghdad around 805 and by the 1100s every large town had a hospital. They provided medical care and prayers for the sick.

The eighth century was a period of great wealth in the Islamic Empire, when Arab rulers believed it was important to develop education. Many Greek medical books were translated into Arabic by Islamic scholars. The city of Baghdad was the main centre for collecting and translating medical texts. Without these translations the books by Galen and others could well have been lost amidst European wars.

Islamic doctors wrote multi-volume medical encyclopaedias which organised medical knowledge with great thoroughness. They included the work of Galen and other Greek medical writers. These books were later translated from Arabic into Latin and were

used in Europe so that European physicians learned more about the work of Galen and Arab doctors. Two of the greatest Arab doctors were:

al-Razi (c.860-925) known in Europe as Rhazes. He wrote over 200 books, including his own ideas but also believed 'he who studies the works of the Ancients, gains the experience of their labour as if he had himself lived thousands of years'.

Ibn Sina (980-1037) known in Europe as Avicenna. His medical encyclopaedia, *The Canon*, was used to teach European physicians until the 1600s. He included the work of the Greeks and his own methods and was known as the 'Galen of Islam'.



Hospitals and Healers

Looking after the sick was an important part of the work of the Christian Church and this led to many hospitals being founded in the Middle Ages. By 1400 there were over 500 hospitals in England, although many had only five or six beds.

Hospitals were very careful who they took in. For example, many hospitals would not accept patients that had a contagious disease.

Some hospitals were set up to care for particular cases. For example, the Lord Mayor of London, Richard Whittington, paid for an eight-bed hospital for unmarried pregnant women. Leper houses were built outside towns to separate the victims of leprosy from healthy people.

Most hospitals were like care homes today, looking after the poor and elderly. They provided food, rest and prayer. People believed that God sent sickness to punish them for their sins, so they joined in the prayers in the hope that God would realise they were sorry for their sins. Nursing care was provided by nuns who had a good knowledge of herbal and other remedies, often drawn from the books in their library.

Outside hospitals women treated the vast majority of illnesses. Mothers and wives had a wide range of remedies at their fingertips, although sometimes the local wise woman was called in to use her skills and knowledge. Women also acted as midwives.

If you had a little money or were very worried about your illness you could see a local surgeon. Some surgeons were very skilful, learning through practice as apprentices to experienced surgeons. Guilds of Master-Surgeons required new members to gain licences by passing tests.

Women could qualify as surgeons by working as apprentices. Family links played an important part in giving women this opportunity.

Only the rich could afford to go to a physician. Physicians were the highest-ranking doctors because they trained at universities. In the 1300s there were fewer than 100 physicians in England.

Beliefs about causes of disease

The most common belief was that God sent illnesses to punish people for their sins. The Anglo-Saxons also believed that elves and spirits, the Devil's helpers, shot invisible arrows, known as elf-shot, to cause everyday illnesses such as headaches.

A common explanation was that bad air (miasma) caused illness. Some people did link the bad air to dirt and filth in the streets, but could not explain exactly what the link was.

Knowledge of the body

Bodies were dissected as Galen had recommended. In the 1300s human dissections were an important, if small, part of medical education in Italy and Spain. Universities in England copied this in the 1500s.

Nothing new was learned from these dissections because they were demonstrations that Galen's descriptions of the human body were correct, not investigations to make new discoveries. Physicians believed that Galen's books contained everything that needed to be learned about the human body.

Nothing new was being learned because people did not challenge traditional ideas. But regular dissections were a step forward because one day someone would use dissection to challenge Galen's descriptions of the body.

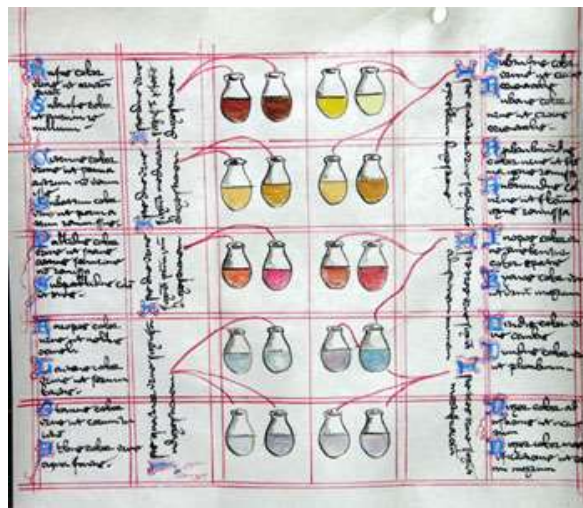


However, there were new ideas among Arab doctors. Ibn al-Nafis (1200-1288) investigated the anatomy of the heart and was brave enough to challenge Galen. Galen had said that the blood moves from one side of the heart to the other through invisible channels; al-Nafis used his own observations to say that these channels did not exist. He suggested that blood moves from the heart to the lungs and then back to the heart, thus circulating round the body. This idea was correct, but nobody built on his work and it wasn't until the 1600s that this discovery was made in Europe.

Diagnosing and treating illness

The physician's most important piece of equipment was his urine chart. The physician matched the patient's urine against the colours, smell and density shown on the chart. He might also taste the urine to check that it was normal.

Wealthy patients sent their urine to their physician to make sure that they were not falling ill. This method of diagnosis (uroscopy) fitted the Theory of the Four Humours. For example, very white urine was a sign of too much phlegm in the body.



Physicians also followed Hippocrates and Galen by making careful observations of symptoms. This led the Arab doctor al-Razi to describe for the first time the difference between smallpox and measles.

Once the physician had decided on the treatment, he then chose the best time to carry it out. This required knowledge of astrology because they believed that parts of the body were linked to signs of the zodiac and the planets. The Zodiac man showed the doctor when to avoid treating each part of the body. When the moon was in Pisces, for example, the feet should not be treated.

Bleeding charts were used to show the surgeon where to take blood from. Treatments such as bleeding were carried out by a surgeon. Bleeding was done by warming a bleeding cup, placing it over a small cut and letting the warmth draw blood out of the cut. Alternatively, leeches were used to sink their jaws into the patient and draw off blood, a method still used in the nineteenth century. People were bled regularly as a way of avoiding illness.

Common herbal remedies were based on plants or herbs, minerals and animal parts. Most women knew these by heart, but increasingly they were written down in commonplace books or 'herbals', books illustrating each plant and other ingredients, the exact quantities required and how to mix up the potion. They also included prayers to say while collecting the herbs to increase the effectiveness of the remedy.



Surgery

There were some developments in surgery during the Middle Ages. For example, John Bradmore, the royal surgeon to Henry IV, designed a metal forcep to remove an arrow that had become lodged in the cheek of the Prince of Wales during the Battle of Shrewsbury.

Another example of surgical development relates to Galen's ideas about pus. Since the Greeks, doctors had said that wounds were more likely to heal if pus (known as 'praiseworthy pus') developed. Galen agreed with this idea. Doctors believed the pus carried away poisoned blood that caused infection. Doctors therefore covered wounds in ointments and bandages designed to make pus develop.

Then Hugh and Theodoric, a father and son from Lucca in Italy, dared to say this idea was wrong! Theodoric wrote 'It is not necessary for pus to form in wounds. There can be no greater mistake! Such a procedure is quite against nature, prolongs illness, prevents healing and hinders the closing up of wounds. My father used to heal almost every kind of wound with wine alone, and he produced the most beautiful healing without any ointments.' Hugh's methods would have been effective because wine attacks infections.

Most surgery was similar to the operations carried out by Greeks and Romans. Surgeons removed small tumours on the skin's surface, sewed up or cauterised large cuts, dealt with dislocations and broken limbs. The most skilful surgeons used extremely fine needles to remove cataracts from eyes.

Surgeons did not just rely on practice. They read books too. Roger of Salerno wrote the first European textbook on surgery c.1180. Guy de Chauliac (c.1300-1368) dedicated himself to proving that a surgeon required just as much education and intelligence as a physician. He did this by writing a seven-volume book.

Public Health

Medieval towns were much dirtier than Roman towns. Water for drinking and cooking was collected from the river or storage pits, which were often next to the cesspits people used as toilets. Pigs and chickens roamed the streets. Rats, mice and hawks scavenged in streets full of rotting fish bones, animal dung, food waste and even human faeces.

Animals were always a problem. People used horses for transport. Cattle, sheep and geese constantly arrived to be butchered for food. But conditions did improve a little. By 1200 many houses in cities like London and York had stone foundations. A few were built entirely of stone. Cesspits were lined with brick or stone and so were less likely to leak into drinking water supplies.

However, the problems were always greater than the solutions and medieval monarchs believed that it was not their job to look after people's health.

The best public health facilities were in monasteries because they could afford them. Monks were better fed than most people, did less physical work and had facilities such as water pipes bringing fresh water and flushing latrines.

The Black Death

The Black Death was one of the most frightening outbreaks of disease in history. The epidemic began in China, spread to India and across Europe, reaching England in 1348. Historians now estimate that at least 40 per cent of Britain's population died.

We now know that the Black Death was caused by fleas that were carried by rats. A flea became infected when it bit an infected rat, then passed the disease on to other rats and to humans when it bit them. People bitten by an infected flea suddenly felt cold and tired and then discovered painful swellings called buboes in their armpits and groins. Blisters appeared all over their bodies, followed by high fever, severe headaches, unconsciousness for several days and then death.

Medieval people had many explanations of what had caused the Black Death. Some of these were:

- the planets had become misaligned
- it was a punishment from God for sin
- miasma (bad air)
- water supplies poisoned by Jews
- evil humours

In the same way, there were many different ways in which people tried to prevent and treat the Black Death. Some of these were:

- flagellants - people who walked through towns whipping themselves to show God that they have repented their sins, so there was no need for Him to give them the disease
- Galen's opposites theory
- street cleaning
- burning Jews
- praying and attending extra church services

Renaissance Medicine

Reasons for the Renaissance

Renaissance means 're-birth'. In general the Renaissance period was a time of 're-born' interest in all things Greek and Roman, their books and ideas, buildings and sculptures. But, in medicine, interest in the Greeks and Romans has never gone away because physicians had kept reading and relying on Galen. So what exactly was being re-born in the medical Renaissance?

After the Black Death many of the survivors were better off because employers had to pay higher wages to attract workers. Many people had spare time and spare money and they spent some of this time and money on education.

Wealth and education helped trigger the Renaissance. Educated people during the Renaissance thought that the Greeks and Romans were just like them - intelligent and thoughtful. They looked down on the people of the Middle Ages as ignorant.

In universities in the 1500s scholars were still reading translations of Galen, but now they were worried. The translations had been made in the Middle Ages. What if they were wrong? What if vital knowledge had been missed out or misunderstood by ignorant people in the Middle Ages? They decided to make new translations to make sure they were right. They published new editions of Greek and Roman books, including nearly 600 editions of Galen's books.

So what was re-born? It was not just interest in Greek and Roman ideas that was re-born but, far more importantly, their love of enquiry and willingness to challenge existing ideas. Once they began to ask questions and look carefully some people began to realise that Galen had not known everything - and had even made mistakes!

This work changed attitudes. In the Middle Ages, people respected traditional ideas and simply copied Greek knowledge and ideas. They did not challenge them. But in the Renaissance, people realised that the Greeks loved enquiry - asking questions, challenging old ideas (like the gods causing disease) and suggesting new ones (the Theory of the Four Humours). If the Greeks could ask questions and challenge old ideas, then so could they, the people of the Renaissance.

But not everyone agreed. Many people still conservatively stuck to tradition, not daring to think for themselves, still saying it was wrong to challenge Galen. So what developed was a battle between attitudes - between people defending the old ideas and people fighting for new ones.

Andreas Vesalius

Andreas Vesalius was born in 1514 and died in 1564. He was Professor of Surgery in Padua, Italy. In 1543 Vesalius published a book called *The Fabric of the Human Body*, a detailed a fully illustrated description of human anatomy.

Vesalius respected Galen's work but proved that Galen was sometimes wrong. For example, Vesalius showed that:

- the human jaw bone is made from one bone, not two as Galen said
- the breastbone has three parts, not seven as Galen said
- blood does not flow into the heart through invisible holes in the septum - such holes do not exist.

Vesalius showed that doctors could learn more about anatomy and had to carry out human (not animal) dissection to learn more.

Vesalius made great use of the new invention of printing. He chose the best printer and supervised the engraving of the illustrations and the printing himself. Without printing Vesalius' work would not have had such an impact. Thousands of copies were printed quickly and used all over Europe.

Vesalius was inventive and determined. Once he stole the body of a criminal from the gallows to dissect and he worked at Padua where dissection was encouraged.

However, many doctors refused to accept that Galen could be wrong. Some said that Vesalius' work only showed that the body had changed since Galen's time. The heavy criticism led Vesalius to leave Padua and work for the Emperor Charles V.

William Harvey

William Harvey was born in 1578 and died in 1657. He studied medicine in Cambridge and Padua and worked as a doctor in London. He later became doctor to King Charles I.

Galen had said that new blood was constantly manufactured in the liver to replace blood burned up in the body. Galen also believed that blood passed from one side of the heart to the other through invisible holes in the septum. This had been challenged by Ibn al-Nafis and Vesalius, but neither could provide an alternative explanation.

Two other doctors had made discoveries that paved the way for Harvey:

- Realdo Columbo (1516-1559) said that blood moved along the vein and arteries.
- Fabricius (1533-1619), Harvey's tutor at Padua, proved there are valves in the veins.

Harvey proved that the heart acts as a pump, pumping blood around the body. He did this by:

- dissecting live cold-blooded animals whose hearts heat slowly so he could see the movement of each muscle in the heart
- dissecting human bodies to build up detailed knowledge of the heart
- proving that the body has a one-way system for the blood - he tried to pump liquid past the valves in the veins but could not do so
- calculating that the amount of blood going into the arteries each hour was three times the weight of a man. This showed that the same blood is being pumped round the body by the heart.

Mechanical water pumps in London may have given Harvey the idea that the heart is pumping blood.

Harvey had read the work of earlier doctors and was able to use it to build up his theory.

However, there was still much more to discover about the blood. Doctors could not make blood transfusions until they discovered blood groups in 1901. Also, Harvey's discovery was only gradually accepted. Some doctors ignored his theory. Others said that he was wrong because he was contradicting Galen. It was nearly fifty years before the teachers at the University of Paris taught Harvey's ideas rather than Galen's.

Harvey published his discovery in 1628, in his book called *An Anatomical Account of the Motion of the Heart and Blood*. Harvey said that after he published his book fewer patients came to see him. Many thought his idea mad.



Ambroise Paré

Ambroise Paré was born in 1510 and died in 1590. He learned surgery as an apprentice to his brother, then worked at the Hotel Dieu, the royal hospital, in Paris. He spent 20 years as an army surgeon, then was surgeon to the kings of France. Paré was the most famous surgeon in Europe because of his books *Ten Books on Surgery* and *Apology and Treatise*.

Paré changed surgery in a number of ways. For example:

- He changed the treatment of gunshot wounds. He replaced the use of boiling oil on wounds with his own mixture of egg yolks, oil of roses and turpentine. However, Paré only used this mixture because he had run out of boiling oil, which was the useful treatment for gunshot wounds at the time.
- Paré used ligatures to stop bleeding - silk threads tied around individual blood vessels. He did this instead of using a cauterising iron, which he called the 'old and too cruel way of healing'.
- He designed and arranged the making of false limbs for wounded soldiers, and included drawings of them in his books to spread the idea.

As an army surgeon, Paré had plenty of practice and opportunities to try new methods. Printing spread Paré's ideas much more quickly and widely than the new ideas of medieval surgeons such as Theodoric of Lucca.

Paré was willing to learn from his work and did not rely on reading books. He wrote angrily in reply to physicians and critics: 'How dare you teach me surgery, you who have done nothing but look at books. Surgery is learned with the eye and the hand.'

However, there were some problems with Paré's discoveries. For example, stopping bleeding with ligatures was slow. Fifty-three ligatures had to be tied when a thigh was amputated. In the chaos of war, using a cautery was faster and could be effective. Also, ligatures were dangerous because the thread could carry infection deep into a wound, causing death. A better antiseptic than turpentine or wine was needed, but this wasn't discovered for another 300 years.



Healers

University-trained physicians still accepted Hippocrates' theory that illness was caused by an imbalance in the body's humours. Their training still concentrated on the writings of Greek doctors, especially Galen, and Arab doctors such as Ibn Sina. They also read the work of Vesalius, Paré and Harvey, but were often reluctant to accept that Galen could have been wrong. Like their medieval predecessors, physicians also advised their clients on how to stay healthy through a good diet and exercise.

Physicians also watched dissections taking place. However, even in the 1660s, a century after Vesalius had shown how important human dissection was, they still sometimes had to make do with dissecting animals.

Women still played a major part in everyday medicine. Wealthy ladies often provided care for local families. Women continued to work as midwives, although the first handbooks for midwives were written by men who had little practical experience. The first English handbook by a woman was *The Midwives Book* by Mrs Jane Sharp in 1671.

However, wealthy patients were becoming less willing to go to women healers and preferred fashionable physicians instead. This was nothing to do with experience or effectiveness but wanting to be seen to be going to the most expensive doctors. Women were still not allowed to go to university so could not match the theoretical knowledge of men, no matter how good their practical skills.

Another development which downgraded women's role was a secret discovery. About 1620 Peter Chamberlen invented the obstetrical forceps, used to free a baby from the womb during a difficult birth without hurting or killing baby or mother. Male physicians said that only men should use forceps because only they had been to university to gain anatomical knowledge.

There had always been quacks, healers with no training, although the word was new. Many were simply out to make as much money as possible by selling their charms, potions or bottles of medicine. Some did very well indeed. Joanna Stephens (died 1774) claimed to have a remedy that would dissolve bladder stones without needing painful surgery. Parliament paid £5000 to buy the recipe from her!

Treatments

Many home remedies were handed down through generations from mother to daughter. Girls learned how to mix up remedies, using ingredients such as honey, which we now know kills bacteria. More people were writing down home remedies because more people could now read and write.

European travels to America and Asia led to the arrival of new ingredients for medicines. Rhubarb from Asia was widely used to purge the bowels. The bark of the cinchona tree was imported from South America because of its effectiveness in treating fevers. In Europe it became known as quinine and helped many who suffered from malaria.

Less helpfully, opium was imported from Turkey and used as an anaesthetic. Tobacco was greeted as a cure-all when it arrived from America, being recommended for toothache, poisoned wounds, joint pains and as protection from plague.

In 1566 a visitor to King Charles of France gave the king a bezoar stone, which came from the stomach of goat-like animals. The visitor insisted that it would cure all poisons, but when King Charles asked Ambroise Paré, his surgeon, Paré said that it could not possibly cure all poisons because a hot poison needed a cold antidote and vice-versa. Paré then suggested a test on a live patient! A cook who had been sentenced to death for theft was offered the chance to live if he took poison and then the bezoar stone. If the bezoar stone worked he would be free! The cook accepted the chance, took poison and then the stone. He died in agony several hours later. It was another triumph for experiment and enquiry, though not so good for the cook.

Between 1660 and 1682 over 92,000 people visited the King's court, believing that if Charles II touched them they would be cured from scrofula, a skin disease known as the King's Evil.



Public Health

After the Black Death of 1348 plague never completely disappeared. Leicester, for example, suffered ten outbreaks of plague between the 1550s and 1640s.

One major reason was that towns were still over-crowded and full of dirt. The Government did issue some orders, such as saying that bundles of straw had to be hung as warning outside the homes of plague victims and that people who came from infected houses should carry a white stick in public. However, little was done to enforce regulations because of the cost of employing people to do this at a time when there was no police force.

Many people still believed that plague was sent by God as a punishment for their sins. In 1665 the government ordered days of public prayer and fasting so that people could publicly confess their sins and beg God to be merciful.

Others blamed the movement of the planets, or miasma, just as in the Middle Ages. However, there were also signs of a more scientific approach based on observation of the evidence. Some observers linked dirt and disease after realising that the highest numbers of deaths were in the poorest, dirtiest parishes where people lived crammed into the worst housing.

Methods of preventing the spread of plague were carefully thought out and organised. The Mayor of London ordered that victims be shut up in their homes and watchmen stood guard to stop anyone going in or out. When anyone died, the body was examined by 'women searchers' to check that plague was the cause. Their findings were confirmed by surgeons. Bedding had to be hung in the smoke of fires before it was used again.

Householders were ordered to sweep the street outside their doors. Pigs, dogs, cats and other animals were not to be kept inside the city. Plays, bear-baiting and games were banned to prevent the assembly of large crowds. These methods helped a little, but it took a combination of cold weather and the disease reaching the end of its natural course to put an end to the Great Plague.