Medieval (1250-1500)

Ideas about CAUSE of disease

Supernatural ideas:

The Church was hugely powerful:

Belief in heaven / hell

- No education, so people learned from church
- God punishes sinners
- Disease is a punishment sent by God.

Astrology

Idea that the position of the stars affects our lives. Physician would consult star charts and when a patient was born to make diagnosis

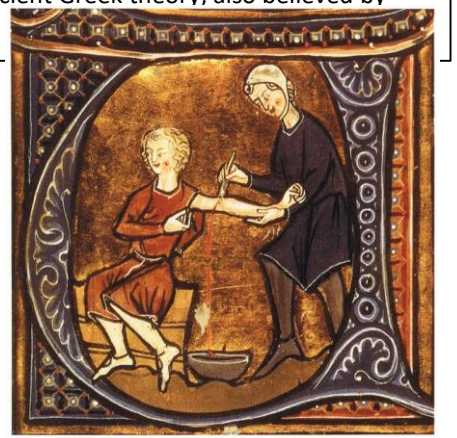
Four Humours

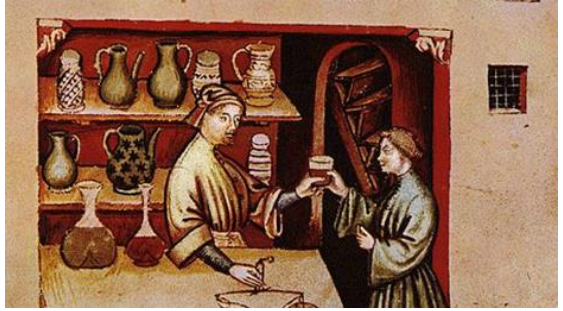
This was an ancient idea, first put forward by Hippocrates (a Greek physician and philosopher). The universe is made up of four elements; and the body is made up of four humours (liquids)

If these humours are in balance the body will be healthy, when they are unbalanced you become ill. Galen (Roman physician) developed the idea with theory of Opposites. For example, f you had a phlegmy cold, this should be balanced by eating something hot eg pepper.

Miasma

Bad smelling air thought to be harmful – so corpses, rotting matter, swamps thought to cause disease. Ancient Greek theory, also believed by Galen.





Approaches to TREATMENT and PREVENTION

Treatments:

Religious/supernatural

Prayer; saying mass; fasting; going on pilgrimage – all advised as religious "treatments"

Some believed disease because punishment was sent by God, you should not try to treat.

Humoural Treatments

Physician suggested a treatment for each symptom, including bleeding and purging; bathing (only available to rich); remedies (made from herbs and spices)

Prevention

PRAY!

Practice basic hygiene (as recommended in the Regimen Sanitatis)

Purifying bad air (eg carry a sweet-smelling "posy"; some measures were taken to keep towns clean, like clearing animal corpses)

Who cared for the sick?

- The Physician was university educated; expensive so only available if you were rich
- Diagnosed illness by: observing sample of urine / faeces / blood; consulting astrological charts.
- Apothecary mixed the herbal remedies.
- Surgeon performed basic operations and bleeding
- Approx. 1,100 Hospitals by 1500, 30% run by Church.

Provided clean place to rest and eat well.

Many hospitals were places for travellers to stay

- Most people cared for at home (kept clear, fed, herbal remedies). This was generally considered to be a woman's role.

Case Study: The Black Death (1348)

Killed 1/3 of British population 1348-50

Bubonic Plague: spread by fleas on rats

Pneumonic Plague: spread by coughing

Ideas about cause

People did not understand real cause, they thought it was:

- Punishment from God
- Imbalance of four humours

How was it dealt with?

- Prayer / fasting / flagellation (whipping)
- Light fires / carry posies to ward off miasma
- Local governments tried to control by
  - buildings new cemeteries
  - close Parliament in 1349
  - enforcing street cleaning in cities, but this often didn't happen

Consequences of the Black Death

Fewer workers, demand higher wages and had more freedoms.

Key Individuals

Hippocrates

Greek phyisician, devised idea of Four Humours

Galen

Roman physician, author of 60+ books. Ideas were basis of medical understanding

Key Vocabulary

Physician: person who practices medicine

Barber surgeon: cut hair / carried out blood-letting

Apothecary: mixed herbal remedies

Remedy: cure for an illness

Four Humours: liquids in body which must remain in balance for good health

Examples of Continuity

- People still believed in ideas of Hippocrates and Galen: Four Humours, miasma
- Church controlled education, very few books. Therefore very few new ideas, and little spread of information

MINOR CHANGE: Use of the Regimen Sanitatis resulted in more hygienic conditions, although only slightly

Renaissance (1500-1700)

Ideas about CAUSE of disease

Time of discovery, scientific progress, experiments.
- The Church had less control over life, so there was a chance for the spread of new ideas.
- The printing press helped ideas to spread.
- Royal Society allowed scientists to gather, share research

This led to lots of **new ideas: eg**
- Better understanding of anatomy, for example blood circulated round the body
- Existence of "animalcules"

Four Humours
This theory had been proved wrong by scientists. However, most people still believed it so most physicians continued to use old methods, eg bleeding.

Miasma
This ides that disease spread by bad smelling air was still believed

Key Individuals
Thomas Sydenham "English Hippocrates". He observed patients' symptoms. This enabled him identify the disease that needed to be treated.
Vesalius Anatomist. Carried out dissections, found errors in Galen's ideas (e.g. lower jaw = one bone, not two. Published in "Fabric of the Human Body"

Key Vocabulary
Anatomy The human body
Diagnose to look at symptoms to work out what disease a patient has
Miasma foul smells, thought to cause disease
Quarantine isolating ill person to stop spread
Transference rubbing an object on a wound to "transfer" illness from the patient

Approaches to TREATMENT and PREVENTION

Treatment
Transference – disease could be transferred to an object by rubbing it
Lots more **herbal remedies** available from newly discovered lands of the New World
The new science of chemistry resulted in lots of **chemical cures**. E.g. antimony used to treat typhus

Apothecaries and surgeons were better trained

Less hospitals available because many of these had been run by the monasteries, which were closed down by Henry VIII

Prevention
Ideas about cause of disease had advanced, but treatments were still not effective. So prevention still very important.
Cleanliness still important; though less use of public baths since arrival of syphilis
Moderation avoiding too much alcohol, cold, food
To **reduce miasma**, homeowners in some towns had to pay a fine if they did not clean outside their homes

Case Study: William Harvey

English doctor who investigated and explained the circulation of the blood

Studied in Cambridge and Italy, worked as a royal doctor

His dissections and research led him to:

- **Show the role of the heart, the circulation of the blood.**
- **He contradicted Galen**
- **Wrote book "An Anatomical Account of the Motion of Blood in Animals and Humans"**

A major breakthrough, but it did not have much practical use in medicine

Case Study: The Great Plague (1665)

Disease continued to strike after 1348 (Black Death) – 1665 was a particularly bad year.
More than 65,000 died in London

Prevention
Measures recommended to help people avoid the Plague:
- Prayer
- Quarantine (plague victim kept isolated from others to stop spread of disease)
  - "examiner" to check if anyone suffering in parish
  - "watchman" guard house of victims
  - Cross marked on every affected house
- Pomander (ball full of sweet smelling herbs) carried to keep away miasma
- Plague doctors wore special costume:
  - Bird design to "transfer" disease away from patient
  - Mask full of herbs
- Public meeting, fairs, theatres cancelled to stop spread of disease
- Carts travelled through cities to collect dead

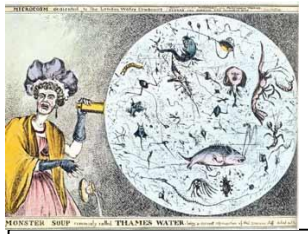
Examples of Change

- Understanding that Four Humour theory was wrong (though it was still widely used)
- Better understanding of human body
- More remedies available from New World (newly discovered land in Americas)
- Use of chemical cures

Examples of Continuity
- Belief in miasma as a cause of disease
- Herbal remedies still popular
- People still used humoural treatments (e.g. bleeding), because patients believed in them.

Changes in ideas, but not much development in actual treatments

C18th - 19th (1700-1900)



Ideas about CAUSE of disease

C18th Age of "Enlightenment" – people thinking for themselves, not just following ideas of church

1861, **Louis Pasteur** published **Germ Theory**. Observed that "microbes" present in the air, these made liquids rot (he was investigating rotting beer).
Proved microbes could be killed by heat (pasteurisation).
1878 published Germ Theory of infection, proving microbes caused disease in humans.

Robert Koch identified that different microbes caused different diseases.
First discovered cholera 1883.
Came up with methods to study bacteria (grow in petri dish, stain with dye to make easier to see) – these methods made it possible for other scientists to make further discoveries.
Koch's work meant that scientists studied diseases, not symptoms.

Impact in Britain
GB doctors – led by Henry Bastian – did not believe in Germ Theory. They still believed in Spontaneous Generation (microbes spread from rotting matter by miasma).
GB government rejected germ theory until end of C19th.

Approaches to TREATMENT and PREVENTION

Hospitals
Florence Nightingale: nurse in Crimean War 1854; hospitals appalling
Made changes to way wounded soldiers treated
- Sanitation (clean hospital, bedding)
- Nurses to provide care
- Good meals provided

Mortality rate (% of wounded dying) fell from 40% to 2%
Nightingale returned to GB
- Set up nursing college; designed hospitals with wards to stop disease spreading; wrote "Notes on Nursing"

Surgery: 3 major problems: pain, infection, blood loss (this was not "solved" until C20th)
Anaesthetic developed to deal with pain.
Other drugs had been used (eg ether), but problems.
James Simpson discovered chloroform.
Some opposed as though pain was sent by God, but when Queen Victoria used chloroform, it became popular
Antiseptic developed to deal with infection. After reading Pasteur's Germ Theory Joseph Lister used carbolic acid during operations to keep wound clean. Many doctors opposed at first, as carbolic was unpleasant

Prevention
Edward Jenner develop **vaccination** to protect against smallpox.
Previously people had been inoculated (given small dose of disease to develop immunity.
1776 Jenner worked out you could make someone immune to smallpox by injecting a small amount of cowpox.
Lots of opposition from church, inoculators and scientists

Public Health
1848 Public Health Act encouraged cities to provide clean water, but not compulsory.
1852 government makes smallpox vaccinations compulsory
1875 Public Health Act. Realisation government should intervene to improve living conditions in cities. City authorities forced to: provide clean water, dispose of sewage properly, public health officer to monitor outbreak of disease, ensure good new housing.

Case Study: Cholera (1854)

Disease first arrived London 1831.
Particularly affected the poor – those living in slums and workhouses.
Three "epidemics" (major outbreaks, killing thousands).
Government tried to prevent by cleaning slums to reduce miasma – did not work.
1854 outbreak studied by **John Snow**.
Snow plotted where all deaths had occurred on a map.
Identified that they were centred around Broad St water Pump.
Took handle off pump, no more victims
Discovered Broad St well was next to a cesspit (toilet pit).
Proved that cholera was spread by dirty water.

Key Individuals

Louis Pasteur developed germ theory
Robert Koch identified specific microbes, developed methods to study them better
Henry Bastian British doctor, did not believe in Germ Theory
Florence Nightingale came up ideas of modern nursing / hospital design
James Simpson discovered chloroform
Joseph Lister develop use of carbolic acid to tackle infection in surgery
John Snow worked out that cholera caused by dirty water
Edward Jenner came up with the concept of using vaccination

Key Vocabulary

Anaesthetic a drug which makes a patient unconscious during surgery
Germ a small organism which can cause disease
Antiseptic germ-free
Microbe germ that can cause disease
Spontaneous generation idea about cause of decay
Epidemic rapid spread of a disease

Examples of Change

- Germ Theory – understanding that germs cause disease
- Surgery became safer
- Hospitals more clean
- Government became involved more involved in health / medicine
- Vaccines developed to prevent disease

Examples of Continuity

- Many people still believed in miasma
- Still major public health issues in cities. Widespread poverty
- No cure for blood loss in surgery
- There was better understanding of cause of disease, but still few cures

Modern Day (1900 -)

Ideas about CAUSE of disease

Scientific understanding of the cause of disease replaced ideas of Four Humours, miasma. Doctors use evidence based knowledge to diagnose patients.

Technology developed to diagnose: blood tests; x-rays; ultrasound scans; endoscopes (camera which can see inside the body).

Genetics

Scientists realised that microbes could not cause all disease – some were passed from parent to child (hereditary illness).

1900 a German scientist first came up with the theory of genetics, but microscopes were not powerful enough to prove the idea.

1953 Watson and Crick discovered the shape of DNA (an acid in every human cell carrying info about characteristics).

This meant they could find the part of the DNA which caused hereditary disease.

Using this information, doctors can know if someone is likely to suffer from a hereditary illness, and take steps to prevent the impact

Lifestyle

During C20th we have better understood the impact of lifestyle choices on health.

Smoking

It is the biggest cause of preventable disease in the world now

A poor **diet** with too much sugar or fat can cause heart disease and type 2 diabetes.

Other lifestyle choices which can cause disease include: excessive alcohol, drug use, unprotected sex and tanning.

Approaches to TREATMENT and PREVENTION

Technology / Chemical cures

Magic bullet = attacks disease, not body

Salvason 606 – first developed to attack syphilis

Penicillin (see below)

Technology has helped to identify and combat diseases

NHS

1911 National Insurance Act only covered working men.

1948 – to provide free healthcare for all from cradle to grave.

Hospital, GP, dentist, ambulance, health visitor

Ongoing debate about cost / quality of service

Pevention

Government has assumed responsibility for public health

Compulsory vaccinations

Laws to provide healthy environment (eg Clean Air Act 1956)

Communication about health risks of lifestyle choice (eg anti-smoking campaigns)

Case Study: Lung Cancer

Second most common cancer in the UK. 85% of cases are smokers / ex-smokers

In C19th only 1% of cancers were lung cancer; 1918 10%; 1927 14% (smoking became more popular – mainly due to tobacco company advertising).

Lung cancer hard to diagnose accurately with X-ray.

Nowadays it can be diagnosed using CT scan – which is more accurate.

When diagnosed treatment can be:

- remove infected part of lung
- Transplant lung from healthy patient
- Radiotherapy: attacking the cancer with radiation
- Chemotherapy: attacking the caner with chemicals.

Government realised smoking was a problem in 1950s, but made lots of money from tobacco tax.

Government action:

- Advertising ban
- Ban on smoking in public
- Anti-smoking campaigns
- Raising taxes

Key Individuals

Crick and Watson discovered structure of DNA

Alexander Fleming first to use penicillin, left notes about what he discovered

Florey and Chain developed use of penicillin

Key Vocabulary

Hereditary disease illness passed from parent to child

Magic bullet chemical which kills disease, but does not affect rest of body

Antibiotic treatment which destroys or stops growth of bacteria in the body

Penicillin first antibiotic

Genetics information about a person stored on DNA in every cell.

Case Study: Penicillin

1871 Joseph Lister used penicillin to treat a patient, but left no record of his discovery.

1928 Alexander Fleming noticed that in his lab, some mould was killing bacteria in a dirty petri dish (it has drifted in through the window). He didn't study further but published his findings.

Florey and Chain were studying antibiotics. They read Fleming's work, 1940 tested successfully on mice.

But couldn't produce large quantities.

When US joined WWII 1941, Florey and Chain got backing from big American drug companies to mass produce.

Examples of Change

- Use of science to diagnose / understand disease
- NHS healthcare free for all
- Government taking responsibility for public health
- Huge increase in the amount of treatments / surgery which can be given
- Lifestyle factors have become an important cause of disease / death

Examples of Continuity

- Still unable to treat some illnesses such as cancer and viruses.