History of major advances in medicine, social medicine and hygiene

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Medicine
▪ epidemics – well known through all of the human history

▪ Until 16th century every disease in epidemic proportion = "pestis" or "pestilentia"
- Early urbanization
- Poor sanitary conditions
Hippocrates - Greece

- Hippocrates (460 – 370) – father of the western medicine
- *De aere, aquis et locis*
- Disease doesn’t result from supernatural forces, but primarily is associated with environmental factors, diet and other habits
- Used terms like acute and chronic diseases, endemic and epidemic occurrence of disease
- Galen – miasma theory
Rome

▪ Roman Empire: 27 bK – 476 (Western); 1453 (Eastern)
▪ aqueducts, sanitation, thermes, food hygiene …
Middle ages (5-15 c)

- *Dark ages*
- Western Europe experiences social and political disintegration
- Disappearance of big cities
- Christianity – the only force uniting people; convents were learning centers (preserved knowledge of the Greeks and Romans)
- First plague epidemic – 6th century
History of medicine - highlights

- **Bernard de Gordon** in 14th c. in "Lilium medicinae" describes communicable diseases like: leprosy, anthrax, trachoma, acute fever, scabies, epilepsy, but does not mention **plague**, which was a pandemic known as "**black death**"
History of medicine - highlights

- Plague pandemic started in 1332 in India, spread through China and Russia to Constantinople and Italy
- In the middle of 14th c.- whole Asia, Europe and north Africa
- …wasteland, extinct cities, corps lying around, with no one to bury them
“Black death” (plague)

1347 – 1351 – round a quarter to third of the total population of Europe died
The Marketplace in Naples During the Plague of 1656 (Carlo Coppola)
History of medicine - highlights

- “black death” most prominent in Dalmatia (Split, Zadar, Dubrovnik)
- In Dubrovnik in 1377 – first quarantine in the world – 40 days of isolation and observation prior to unloading the cargo and people
History of medicine - highlights

- During 14th and 15th century – other epidemics: variola, disentery, scurvy, laproxy...
History of medicine - highlights

- **Girolamo Fracastoro** – theory about *invisible germs* that spread and cause diseases
  - Through direct contact, via objects, ability to spread far from the source
  - Refutes Galen’s "miasm theory" (poisonous air and fumes)
Girolamo Fracastoro

- "De contagione et contagiosis morbis" in 1543 – claims that germs multiply, are poisonous, could be destroyed by fire

- Recommends regular body hygiene, clean environment, water and food sanitation, disinfection
History of medicine - highlights

▪ at the end of 15th century and in 16th c. – new epidemic in Europe – syphilis

▪ In Italy, Spain…
History of medicine - highlights

- Microscope discovery
- Antony van Leeuwenhoek in 1670
Antony van Leeuwenhoek

- Leeuwenhoek analyzed blood, saliva, bones, muscles, human eye lens, ect.
- Achieved magnification up to 40-160 times, later up to 270 times
In 18th c. doctor from Slovenia Marko Anton Plenčič supports the theory about small living creatures which cause communicable diseases.

He hypothesized that different creature causes different, specific disease.

Described human immunity, susceptibility, incubation, disease carriers, some diseases (scarlet fever, variola).
History of medicine - highlights

- At the end of 18th c. British doctor Edward Jenner noticed that women who milk cows often get cow pox (much more benign than smallpox) and never get smallpox, as a consequence.
Edward Jenner

- After 20 years of observation – experiment on 8 yrs old boy James Phipps
- Jenner took the pus from the hand of a women with cow pox and applied it to the boy – after 6 weeks the boy was exposed to smallpox – didn’t get smallpox

- Published a book about vaccination in 1798 (vacca=cow)
History of medicine - highlights

- Only in 19th century bacteria have been discovered
- Pollender discovered one of the largest bacteria - anthrax in the blood of dead animals
History of medicine - highlights

- **Louis Pasteur** – foundations for modern theory about causes of communicable diseases
  - discovered yeasts
  - introduced *pasteurization* for wine and milk
Louis Pasteur

- Investigated other pathogenic microorganisms
- Noticed how anthrax culture loses virulence – when applied to healthy animal it didn’t cause the disease
- Created **vaccine** to immunize rams against **anthrax**
- In 1881, discovered **streptococcus and staphylococcus bacteria**
In 1885 L. Pasteur introduced vaccination against rabies.

Dried spinal cord from dogs died of rabies Pasteur applied for 9yrs old boy Joseph Meistera, who was bitten by a rabid dog – the boy was saved.

Thanks to Pasteur, countless lives were saved all over the world.
History of medicine - highlights

- During 19th c. in England – **great cholera epidemic**
- **John Snow** – a doctor particularly interested in this epidemics in 1854 creates hypothesis that **cholera was transmitted via water**
1882 Robert Koch discovered *M. tuberculosis*

1890 discovered tuberculin, first considered cure, later became diagnostic tool

- tuberculosis was a pandemic at the end of 19th c. due to poor social and economic conditions
Koch also investigated other microorganisms: cholera, plague, malaria, typhus, amoebiasis
At the end of 19th c. **Koch and Pasteur** formed new discipline - \textit{microbiology}
History of medicine - highlights

- Beginning of 20th c. – discovery of viruses
- 1908 - Karl Landsteiner - poliomyelitis virus
- 1912 - Wilhelm Grueter – herpes virus
In 1907 Paul Erlich introduced chemotherapy (chemicals that selectively destroy microorganisms, without causing damage to the host)

1923 – systematic prophylactic BCG vaccine
History of medicine - highlights

- 1928 Alexander Fleming accidental finding that the presence of molds blocked coccus culture growth

- *Penicillium notatum* - penicillin
Birth of the World Health Organization

- **Andrija Štampar** (1888-1958)
- Created constitution of the WHO
- Chairman of the first Health Assembly (07.04.1948)
Polio

- Jonas Salk developed vaccine against polio in 1955
- USA - number of infected declined from 58,000 in 1952 to 5,000 in 1957
History of medicine - highlights

- Only from 1940s penicillin was applied during WWII against coccus bacteria, C. diphtheriae, anthrax, tetanus
- Over following years – discoveries of other antibiotics, most important was streptomycin (Selman A. Waksman – coined term antibiotic)
History of medicine - highlights

- Discovery of microorganisms, antibiotics and vaccines – led to disappearance of fatal epidemics of the past
- Further progress in medicine, social sciences, technology and economy - led to increased life expectancy in wealthy populations, and change in morbidity and mortality patterns
History of medicine - highlights

- During middle of 20th c. – increase in cardiovascular diseases morbidity and mortality in developed countries
- Leading causes of death, accompanied with cancers and accidents (traffic)
Framingham study

- started in 1948 in USA – most famous and longest cohort study of cardiovascular diseases risk factors
Smoking effects in 1940s?

- http://www.youtube.com
- More Doctors Smoke Camels Than Any Other Cigarette
Smoking effects

- Countless experiments and studies investigated smoking effects.
- In 1951 famous study among British doctors began – smoking and lung cancer association? (R Doll and AB Hill)
History of medicine - highlights

Second half of 20th c. research topics:

- Oral antidiabetic therapy
- Ionizing radiation and leukaemia
- Saccharin and bladder carcinoma
- Thalidomide effects
- Estrogen supplementation and endometrial cancer, and breast cancer
- Passive smoking
- HIV/AIDS
- Risk factors for accidents

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Top achievements in medicine?

- [http://science.discovery.com/convergence/100discoveries/big100/medicine.html](http://science.discovery.com/convergence/100discoveries/big100/medicine.html)

Top 10 achievements in medicine?

- 10. HIV (Robert Gallo; Luc Montagnier, 1980)
- 9. Vitamins (Frederick Hopkins, 1900)
- 8. Insulin (1920-e, Frederick Banting)
- 7. DNA (Friedrich Miescher; James Watson & Francis Crick – model, 1953.)
- Karl Landsteiner in 1900 discovered 4 blood types

Top 10 achievements in medicine?

- 5. X-rays (1895., Wilhelm Conrad Röntgen)
- 4. Anesthesia (1946., William Morton - ether)
- 3. Germ theory – sanitation (*Louis Pasteur*)
- 2. Penicillin (1928., Alexander Fleming)
- 1. Vaccination (Edward Jenner, 1798.)

That's all Folks!