HISTORY OF MEDICINE

OLLI
Spring 2018
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1. Anatomy
2. Blood
3. Surgery (Anesthesia)
4. X-ray Roetgen
5. Germ Theory
6. Vaccination
7. Scurvy, Beri Beri
8. Penicillin 1930
9. Sulpha drugs 1932
10. Insulin 1920
10. Anesthesia
9. Birth control
8. MMR
7. X-ray
6. Insulin
5. IVF
4. Germ Theory
3. Penicillin
2. Vaccination
1. DNA
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Anesthesia
Birth control
MMR
X-ray
Insulin
IVF
Germ Theory
Penicillin
Vaccination
DNA
1. Introduction
2. Wound care/surgery
3. Circulatory system
4. Reproduction
Man
Small bands
High infant mortality
Endemic diseases kept pop low
Short life span
How do we know?
Paleopathologists
Bones
Peat bogs
Frozen
Mummies
Coprolites
Coprolites
diet, disease, seasonal parasitic eggs, seeds
Syphilis

Fig. 2: the entire cranial vault is affected by *caries sicca*, the lesions being more severe on the right side.
Lindow man
300 BC
Iron Age
Otzi
Otzi
Found border Austria/Italy  1991
Lived 3300 BCE   Copper Age
5’5  110#  age >45
High altitude shepherd
Cloak of woven grass
Belt, leggings, loincloth, leather
Bearskin bottomed boots
Chamois meat, herb bread
Tatoos therapeutic, not symbols
Ct scans whipworm
Tools: scraper, drill, flint, bone awl
Arrowhead in left shoulder
King Tut
Witch doctor, shaman

Charms, herbs, small surgeries
What makes us unhealthy?

Evil spirits
Unbalance of humors
Curse
Wrong doing
Punishment of Gods
Test of faith
Religion or magic?

Prayer or spell?

Magic guaranteed

Prayer – up to gods
Ethno-botany:

- salicylic acid
- quinine
- ipecac
- cocaine
- digitalis
- belladonna
Civilization
10,000 BC
Roads - disease traveled faster
City vs urban
Agricultural dependence
4 horsemen of Apocalypse
Pestilence, Famine, War, Death
Earliest civilizations
Nile River    Egypt
Tigris-Euphrates    Middle East
Babylonia, Sumaria, Assyria
Indus River    India
Yellow River    China
Trepanation

6,500 BC
Peru
10,000 skulls
80% lived
obsidian blade
don’t pierce dura mater

France
40/120 skulls
Insanity, epilepsy, headache
Disease – older than written history

Earliest textbook **Great Herbal**
by Emperor Shen Lung 3,000 BC

Babylonians 3,000 BC

Ebers papyrus 1,500 BC

Hippocrates 429 BC
Urinalysis  4,000 BC
Sutures       3,000 BC
Circumcision  2,400 BC
Ayurvedic     2,000 BC

science of life
India
start with 7-day fast
Urinalysis  4,000 BC
Sutures 3,000 BC
Circumcision 2,400BC
Ayurvedic

Susutra teaching
Wisdom of Life
Blood letting  1,500 BC

4 pints of blood
balance humors
Practiced for 2,000 years
George Washington
80 oz. 35% of blood
Age 67
Diptheria, Malaria, TB, Small pox, Dysentery, Quinsy (Tonsillitis, Carbuncle, Pneumonia, Epiglottitis
Not always bad:

deplete iron needed by pathogens
decrease viscosity $\Rightarrow$ increase flow
faint, therefore rest
Hirudo medicinalis

Anticoagulants
Vasodilators
Anesthetics
Clot-dissolving properties
Leeches

4x body weight
20 minutes = 50 ml
Saliva has anticoagulant
Bleed for 10 hours
Keeps blood flowing while healing
Asclepius
Greek god of medicine
5th century BC healing temples
Asclepius
Greek physician
Described in Homer’s *Iliad*

Meditrina=medicine
Hygeia=hygiene
Panacea=all healing
Iaso=recuperation
Aceso=healing
Cult of Asclepius had healing temples with dogs and Asclepian snakes.

Original Hippocratic oath:
“I swear by Apollo the Physician and Asclepius and by Hygieia and Panacea ...”
single staff with snake 
neurotoxins, hemotoxins
125,000 deaths/year from snakes
vs.
Millions with Guinea worm
Exercitationes de Vena Medinensis et de Vermiculis capillaribus infantium by G. H. Velschius (1674)
“And the Lord sent fiery serpents among the people, and they bit the people; and much people of Israel died…” Numbers 21:4-9.
Winding may take days to weeks
Female
2 feet
Male
2 inches
The Life Cycle of Guinea Worm Disease

1. The cycle starts...
Seeking relief from pain, sufferer soaks a blister with exposed worm in nearby water source. On contact with water, the worm bursts, releasing hundreds of thousands of immature first-stage larvae into the water.

2. Tiny water fleas ingest the larvae which, molt twice, becoming mature third-stage larvae. The process takes about 2 weeks.

3. Another person drinks the water containing the water fleas with the infective larvae. The water fleas are digested, releasing the larvae in the stomach.

4. The larvae, which resist digestion, migrate to the small intestine and penetrate the intestinal wall into the body cavity, where they grow into worms and mate.

5. Fertilized female worms, up to 3 feet long, move through connective tissue to various areas of the body, usually the lower limbs.

6. Approximately a year later, after the larvae were ingested, the worm forms a painful blister near the skin surface. The blister bursts, exposing the worm.

7. The cycle continues...

The Carter Center / Graphic by Al Grasberg
“I want to outlive the worm.”

WHO 2015
198 countries free of worm
Drinking straws
Developed by Dupont
Mesopotamia

Code of Hammurabi

Set costs for physicians

Class distinctions:

Elite

Commoner

Slave
Egypt

Imhotep, God of medicine

Ebers papyrus  1,500 BC

700 named drugs

rheumatism

Cosmetics

“Keeper of Royal Rectum”
Ailments divided
1. curable
2. treatable, but uncertain
3. incurable
“Book of Wounds”
fractures, dislocations,
bites, tumors, ulcers,
abscesses
splints with resin soaked bandages
India

Very complex, great diversity

Ayurvedic medicine from Hindu

Maintenance vs. treatment
Rules for surgeons

1. Courage
2. Steady hands
3. Sharp instruments
4. Calm demeanor
5. Unshakable self-confidence
6. Strong-nerved assistants
China

Writings for 6,000 years
Yin and Yang
Inside body and outside body
Acupuncture
160 points
No surgery, no bloodletting
Five phases of Chinese medicine
Tea
6,000 years
Physiologically active alkaloids:
caffeine, theobromine, theophylline
Boil water
Greco-Roman
Foundation of Western philosophy
science, medicine
Hippocrates “Father of Medicine”
“do no harm”
Emphasis on patient
Nature not mystery or magic or Gods
4 humors: blood, phlegm, black bile, yellow bile
Hippocrates 460-370 BC
Knew no A&P, forbidden
Patient care
Humble and passive
Hippocratic bench for bones
Physician: well-kempt, honest, calm, understanding, serious
Observation and documentation
Original Hippocratic Oath

I swear by Apollo, the healer, Asclepius, Hygieia, and Panacea, and I take to witness all the gods, all the goddesses, to keep according to my ability and my judgment, the following Oath and agreement:

To consider dear to me, as my parents, him who taught me this art; to live in common with him and, if necessary, to share my goods with him; To look upon his children as my own brothers, to teach them this art; and that by my teaching, I will impart a knowledge of this art to my own sons, and to my teacher's sons, and to disciples bound by an indenture and oath according to the medical laws, and no others.

I will prescribe regimens for the good of my patients according to my ability and my judgment and never do harm to anyone.

I will give no deadly medicine to any one if asked, nor suggest any such counsel; and similarly I will not give a woman a pessary to cause an abortion.

But I will preserve the purity of my life and my arts.

I will not cut for stone, even for patients in whom the disease is manifest; I will leave this operation to be performed by practitioners, specialists in this art.

In every house where I come I will enter only for the good of my patients, keeping myself far from all intentional ill-doing and all seduction and especially from the pleasures of love with women or with men, be they free or slaves.

All that may come to my knowledge in the exercise of my profession or in daily commerce with men, which ought not to be spread abroad, I will keep secret and will never reveal.

If I keep this oath faithfully, may I enjoy my life and practice my art, respected by all humanity and in all times; but if I swerve from it or violate it, may the reverse be my life.
Hippocratic devices
Romans

Celsus 25 -50 BC

medical text (encyclopedia)

Cure by lifestyle

Cure by medications

Cure by surgery

Inflammation: heat, swelling, red, pain
Hospitals in religious houses
Public health
Clean water
Sewers
Drained marshes
Filtered public bathhouse water
Galen

129-210 AD
Greek surgeon to gladiators
Philosophy: logic, physics, ethics
Comparative anatomy
Physiology experiments
Vivisection
Volumes written, 20 scribes
Authority for 1,300 years
Brilliant physician and philosopher
4 humors:
  blood = extrovert, social
  choleric = energy, passion
  black = creative, kind
  phlegm = dependable, affection
Location of function, revolutionary
Rational soul = brain
Spiritual soul = heart
Appetitive soul = liver
Prolific writer
500 treatises
never translated into Latin, therefore
lost during Middle Ages of Europe
huge advancements reintroduced
Problem: only animal dissections
Avicenna (Ibn Sina)
Islamic
5-book ency of medicine
quarantine
Dark Ages
400-800AD
Medicine prohibited
Prayer only
Middle Ages
800-1400AD

Poor health, disease
Punishment for sin or test from God
Church above all
Monastery – center for medical study
Hospitals as charity, run by nuns
Bubonic plague killed ¾ pop.
Barber surgeons

Blue/white pull teeth

Red/white surgeon
Paracelsus  Swiss  1527  
Burned works of Galen  
First toxicologist
Renaissance 1350-1650

dissection

Michelangelo

Leonardo da Vinci

Vesalius

first book of dissection

On the Fabric of the Human Body
Leonardo da Vinci
Mona Lisa
Leda and the Swan
Pieta
Sistine Chapel
Michelangelo’s David
Andries van Wesel = Vesalius (1514-1564)
Flemish moved to Venice
met illustrator Johan van Calcar, student of Titian
Produced most important work
Since Galen AND correct
de humani coporis fabrica
On the Fabric of the Human Body
Born in Brussels
Educated in Paris
Prof at Padua at age 24
Published 1543
Drawings of Vesalius used for centuries
1543 public dissection
Assembled bones
World’s oldest surviving anatomical
Still in Museum  University of Basel
Correction from Galen (at least 200):
  sternum 3 parts
  heart septum
  vestibule in temporal bone
  fetal circulation
  human caecal appendix
16th-17th Centuries
Pare
Father of Modern Surgery
fractures
artificial limbs
wound care
Developed ligature to seal blood vessels
Stopped cauterization
Stopped boiling oil
Documented ‘phantom’ pain
Anton van Leeuwenhoek “Father of microscope”

Dutch
Made 200 microscopes
275x
560 letters to Royal Society
Animacules

Giardia
sperm
18th Century

James Lind

lime juice for scurvy

inflammation of connective tissue

Scurvy caused death at high numbers
First clinical trials
Group 1: quart cider daily
Group 2: 25 drops of vitriol daily
Group 3: 6 spoons of vinegar
Group 4: \(\frac{1}{2}\) pint of sea water
Group 5: 2 oranges, 1 lemon
Group 6: barley water
Captain Cook took (1768-1779)
wort (0.1 mg/100g)
sauerkraut (10-15 mg/100g)
citrus syrup (40-60 mg/100g)
watercress (662 mg/100g)

Royal Navy 1794
Also:

Typhus

cleanliness

advantage over French

Freshwater from distillation of sea water

frigate with 240 men (1 gal/day)
carried tons of barrels of water

stale

fresh water hard to find
Edward Jenner
vaccination for small pox
Washington inoculated troops in the War of 1812.
All soldiers inoculated in 1805, Napoleon's soldiers.
Previously, 90% died from disease, 10% died from injuries.
19th Century
James Blundell
1st blood transfusion
Joseph Semmelweis
wash hands
Joseph Lister
Pasteur
Florence Nightingale
nurses 1854
“lady with the lamp”
Elizabeth Blackwell
1st physician 1849
Clara Barton
Red Cross 1881
20th Century
Walter Reed
yellow fever
Carl Landsteiner
blood types
Marie Curie
radium
Papanicolaou
cervical cancer
Crick and Watson
DNA
Salk, Sabin
polio
1968 1\textsuperscript{st} heart transplant
1975 CAT
1978 1\textsuperscript{st} test tube baby
1981 HIV/AIDS
1982 1\textsuperscript{st} artificial heart
21st Century
Human Genome
Stem-cell research
Biological Weapons

Hannibal  248-183BC
  anthrax
  poisonous snakes on ships

Tartars  1346 AD
  threw plague bodies

1763 English blankets smallpox
1940 Japanese dropped bubonic fleas
Cancer

1600 BC Egypt
1713 cervical cancer in nuns
1761 nasal cancer from snuff
1775 scrotal cancer in chimney sweeps
1800 leukemia