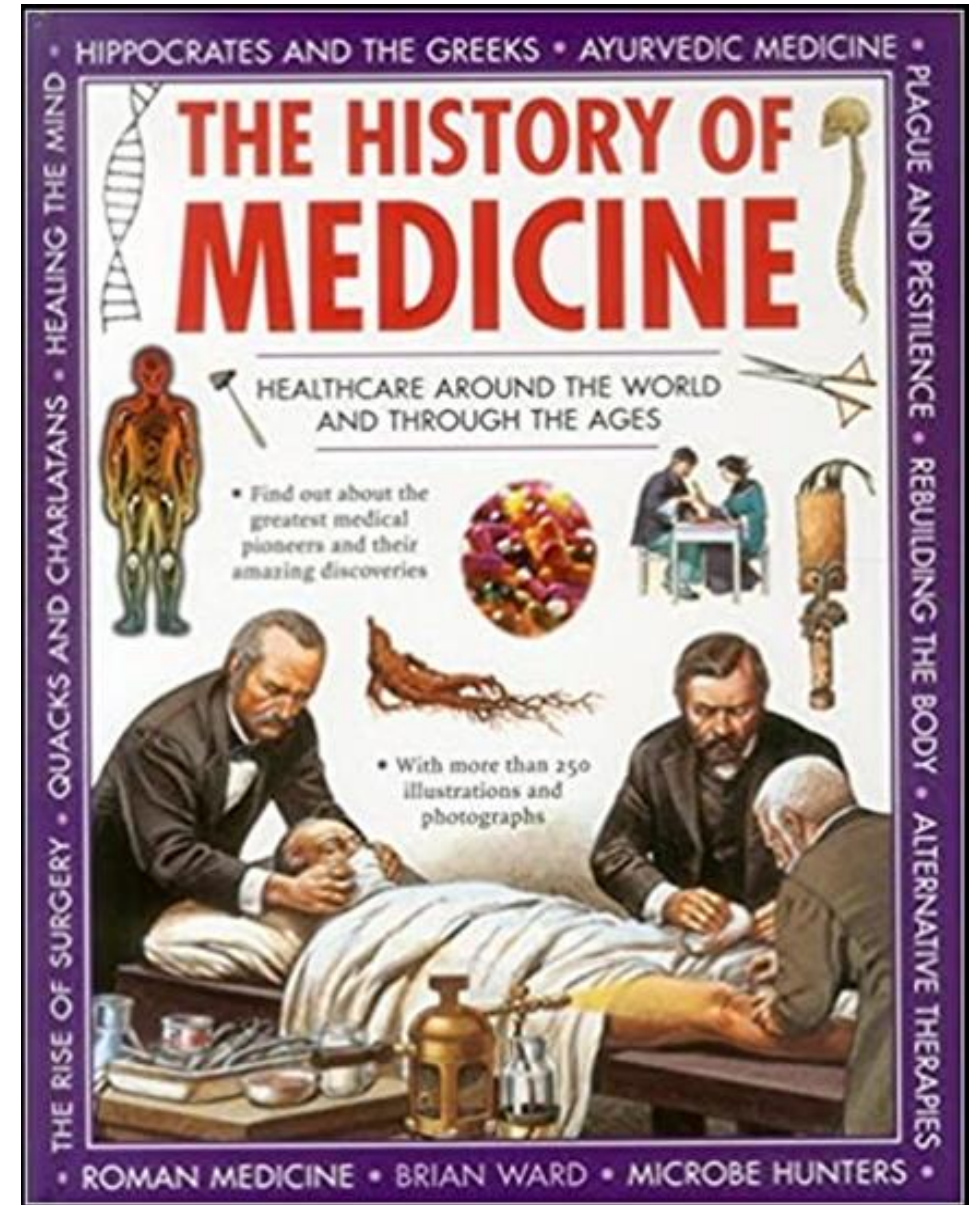


Welcome to the History of Medicine

Seminar presentation composed by
OLENA KOMAR, DrPH, professor



Why study this?

Many things we practice and use in our profession come from things that we developed over the years. We learn from our past and improve our future by examining what works and what doesn't.

As discoveries happen, we adjust our beliefs and practices to be able to treat patients and animals more effectively.

Example:

- Morphine
- Powerful pain reliever
- Comes from poppy plant
- Still used today



PRE-HISTORIC MEDICINE

- Prehistoric men believed that illness and diseases were a punishment from the Gods
- First physicians were witch doctors who treated illness with ceremonies

WAY OF LIFE Hunter Gatherers



Major Threats to Health

Predators



Pregnancy



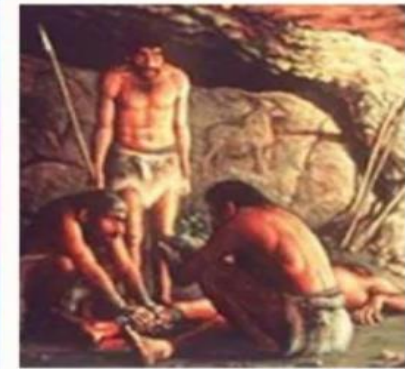
Evidence for 'disease and its management' in the pre historic period is limited to

- fossilized bony lesions
- Comparing with Aborigines
- Cave Drawings



Practical Causes for Ill health

1. Falls
2. Bites
3. Fractures
4. Parasites



Rational Cures

- Good Diet
- Setting of bone fractures
- and Dislocations
- Mud, Herbs and other Plants



Other Cures

Trephination : One of the first surgeries
-A hole was cut into the skull to release Evil Spirits

Prayers and Chants



Different tribes comingled – Exchange of tribal folklore – Ever-increasing compendium of useful, not so useful, and even dangerous remedies developed.



EGYPTIAN MEDICINE-1



Factors Influencing medicine

Wealth



Trade



Science & Technology



Mummification



Egyptians believed gods, demons and spirits played a key role in causing diseases.



Copper:
Disinfectant

Thread & Needle :
Stitch Wounds

Oil Massage: Reduce
pain & Aches



Egyptian
physician
Imhotep



Eye of Horus:
Modern day
prescription
symbol

Ancient Egypt (3300BC to 525BC) : Dawn of "medical care" which was greatly influenced by wealth and trade



EGYPTIAN MEDICINE-2



The Ancient Medical Documents (300 BC)

Edwin Smith Papyrus (1600 BC)



Ebers Papyrus



Ancient Medical Prosthesis



Ancient Egypt Wooden
Prosthetic Toe



Early Egyptian dental bridge

Mashed Pigs Eye for Eye Problems:



Ancient Egyptian doctors prescribed
mashed pig's eyes blended with
honey and red ochre for eye problems

Crocodile Dung as Contraceptive:



Crocodile dung mixed with honey and
mud was used as contraceptive

Mouldy Breads for Treating:



The microbes in mouldy bread
destroyed the pathogens and cured
the infection

The practice of medicine is very specialized among Egyptian, Each physician treats just one disease.

AYURVEDA

Ayurveda [Ayus(life), Veda(knowledge) in Sanskrit] - An Ancient Indian Healing Art



Dhanvantari

Physicians of God emerged from Ocean of milk with amrutha and Herbs in his hands

Traditional Hindu Medical system
Native to India –
Diet, Herbal treatment & Yoga



Establishment of huge ancient universities -Takhsashila and Nalanda contributed to the spread of knowledge to various parts of the world.



Panchamahabhut:
Five basic elements of the Entire Creation Space , Air, Fire, Water and Earth



Samhitas: Charaka, Sushruta and Agnivesha-

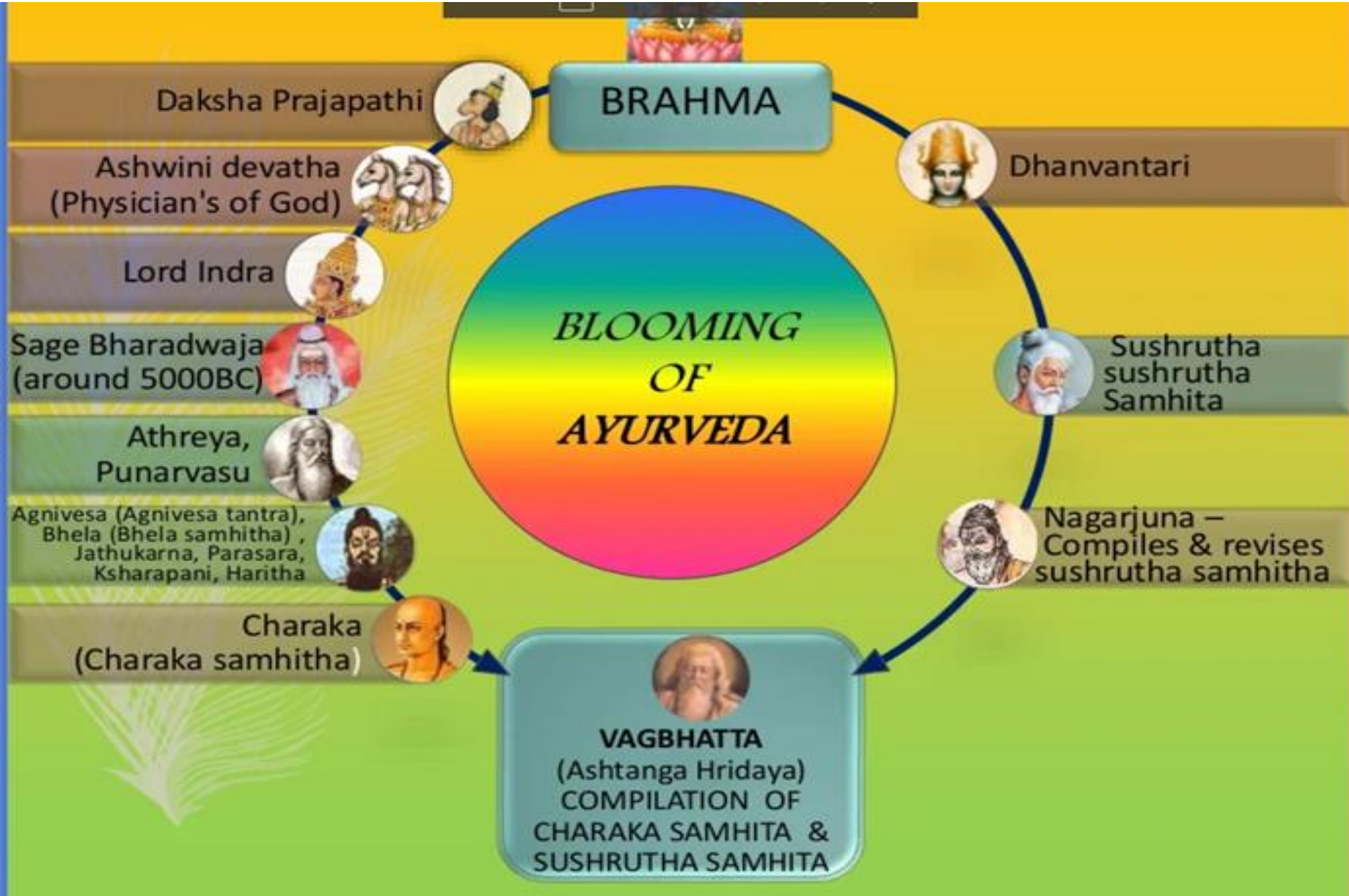
- Ancient Hindu Medical texts
- Contains material regarding surgery and medicine
- Described properties of 1270 species of plants
- 8000 herbal remedies in Ayurveda
- Surgeries as cataract and Rhinoplasty



The world's first university Takshashila had 8 year course on Ayurveda around 600BC

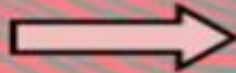
The glories of Hindu medicine rapidly declined when waves of invaders attacked India

Oldest surviving complete medical system in the World – A highlights the way of life that teaches how to maintain and protect health



CHINESE MEDICINE

Shang Dynasty
(1766-1122 BC)
Origin of Traditional
Chinese medicine



Chou Dynasty(1122-403 BC)
Confucius(551-479)
Foundational text of Chinese
medicine is the Huangdi neijing,
(or Yellow Emperor's Inner
Canon)



唐太宗

Tang Dynasty
The Suwen, a part of
the Huangdi neijing
expanded and
revised

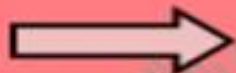


Jin Dynasty (215-282)
Huangfu Mi
acupuncture and
moxibustion



Qing Dynasty
18th century

Proliferation of popular
books as well as more
advanced encyclopedias on
traditional medicine



19th century, **Western
medicine** was introduced at
the local level by Christian
medical missionaries

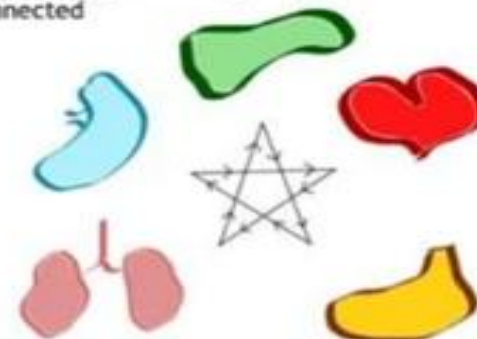
CHINESE MEDICINE

Principles of Traditional Chinese Medicine



The human body needs harmony within and with the Universe

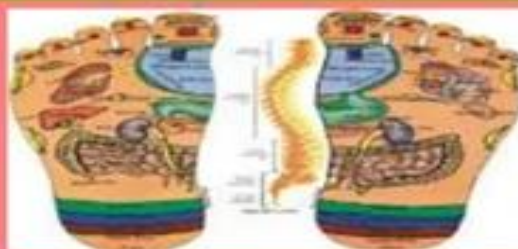
We don't have isolated organs but organ systems that are interconnected



The typical Traditional Chinese Medicine therapies



Acupuncture



Acupressure



Moxibustion



Cupping



Herbal Formulas



Tuina (Massage)



Qigong Exercise

BABYLONIAN MEDICINE



CODE OF HAMMURABI (1800 BCE)

- Legally Established tariff for services of Doctors
- Indicates - medicine was centuries old at that time



bandages, creams and pills



Extensive Diagnostic Handbook
(Clay Tablets) by Ummammu



Preparation and Sources of
Medicine at Ancient Babylon

Babylonian Queen of Night
Ishtar (Healing Goddess)

couching for cataract

- But there was no systematic fund of knowledge of the human body
- Diseases – Caused by demons or angry Gods



Babylonian cylinder seal and sketch depicting
Nergal, god of plague, symbolized by the
crooked stick.

Babylonians introduced the concepts of diagnosis, prognosis, physical examination and prescriptions.
Patients were treated with various therapies.

BOTH MAGIC AND MEDICINE SERVED AS STRATEGIES FOR HEALING THE SICK.

GREEK MEDICINE



460-355 B.C.



Logical
Big Thinkers
Hippocrates
Theophrastus

Hippocratic
Collection
(Books)
Oath
4 humours
Clinical
Observation-
Still used today
(Big impact on
Medicine)

Knew Belladonna, Peppermint, Aniseed
But Still Believed in Supernatural Ideas too



Library at
Alexandria

Asclepius

Hygeia
Panacea

Snake

**Extensive
Documentation**
• Theophrastus
(compiled 450
medicinal
Plants)



While Ancient Civilizations were undoubtedly versed in the use of herbs as medicines,
Extensive Written Records Appeared only During the Time of Greeks.

ROMAN MEDICINE



'Prevention is better than Cure'
Galen

But still believed in Gods and Supernatural ideas too



Adopted Asclepius



Public Health
(Empire needs Healthy Army)



4 humours cont...

Use of Opposites

Dissection

Dissected pigs, learnt brain important but also made mistakes
Said human form made by one God (therefore Catholic church later backed him)

Aqueducts, Toilets, Baths, Sewers



The medical knowledge was acquired by Romans by Greek physicians who were brought into Roman empires, mostly as **Slaves**

DARK AGE (400 – 800 A.D)

After Roman Era, Practice of medicine reverted back to primitive medicine dominated by Superstiton and Dogma



Diagram shows various points for Bloodletting. Patients were bled for common conditions like fever so that tainted blood could be removed to restore proper body balance. But the picture doesn't show a detail about where veins are.



Doctors combined Galenic medicine with careful studies of the stars. This picture shows how the stars influence the human body.



Trephining involved removal of a piece of bone from the skull & was widely practised in this period. It was mostly performed to provide passage for the evil spirits to escape.

- Less importance on the value of Public Health facilities
- Low literacy of Public



There was an emphasis on bandage placement, but none on sterile practices.

Europe was ravaged by Epidemics

Church taught that God sent illness & repenting would cure all evils many people at the time believed that pilgrimage would cure them



Time of intellectual and societal stagnation throughout much of Europe, But the torch of academia continued to burn brightly in the Islamic world.

MEDIEVAL MEDICINE (AD 800 –AD 1400)

Black Death (1348–49)

A frightening Outbreak, Bubonic Plaque originating in Asia, arrived to Europe. Painful swellings (buboes) of apples size in the groin and armpits and oozing red and black spots appeared all over the body, giving disease the name the Black Death. Nearly 1/3rd of the European population died.



Medical Development

Other epidemics: **Variola, Dysentery, Scurvy, Leprosy**

- Renewed Interest in **Roman and Greek Medicine**
- First hand Knowledge of **Arab Medicine**

Girolamo Fracastoro

- Theory about invisible germs that spread and cause diseases
- Refutes Galen's "miasm theory" (poisonous air and fumes)



Ibn al-Nafis (1200-1288)

An Arab Doctor, investigated the anatomy of heart and was brave enough to challenge Galen.



In 1066 the Normans invaded Europe. This period brought improvements to public health, travel became safer, Church became rich and trade increased.

RENAISSANCE MEDICINE

Humanism

'Re-born' interest in Greek and Roman Medicine, buildings and Sculpture



*Factors Which **favourably** affected progress in medicine*

close study of classic texts



Love of enquiry - willingness to challenge existing ideas.



The Printing Press



Weakening Power of the Church



Artists attended dissections of human corpses and did illustrations for medical books.



Wealth and education triggered the Renaissance

*Factors which **adversely** affected progress in Medicine*

Reappearance of Great Plague of 1665
other infectious diseases were common



lack of sewage and other Public sanitation system



Bleeding by using leech was practiced



Quacks were present as people couldn't meet doctors



Wars



Although new discoveries were made,
people still did not know what caused illness.

RENAISSANCE MEDICINE - PIONEERS



PARACELSUS

Swiss German Physician

Father of Toxicology

pioneered the use of chemicals and minerals in medicine.

Introduced Laudanum, an opium tincture

forerunner of Antisepsis

clinical diagnosis and highly specific medicines.



AMBROISE PARE

French Battlefield - Later Kings Surgeon.

Tried less brutal methods - simple dressings and soothing ointment for wounds.

Promotion of ligation of blood vessels - Amputation

Promoted artificial limbs as well as an artificial eye.



ANDREAS VESALIUS

Brussels Anatomist Physician

author of one of the most influential books 'De humani corporis fabrica.'

Vesalius found that the human breastbone has three segments, not seven as Galen claimed.

Encouraged Human Cadaver Dissection



WILLIAM HARVEY

English Kings Physician

Understood and explained the circulatory system and role of heart & Valves

Challenged Galen - Blood not a body fuel but constantly recirculating in the body

All mammals reproduced via fertilization of egg by sperm



MEDICINE IN 17th & 18th CENTURY

- Robert Hooke (1665)

- coined the term cell for describing biological

'CELL'



- Antony leewen Hoek

- "In the year of 1657, I discovered very small living creatures"

Microscope



- John Hunter

- founded surgical pathology, and raised surgery to the respectable science

Surgery



- Giovanni Battista Morgagni 1761

- postmortem examination of 700 cases, Attempt to correlate the findings after death with the clinical picture when alive

Pathology



- William Smellie

- leading obstetrician in London
- systematic discussion on the safe use of obstetrical forceps

Obstetrics



- James Lind,

- a British naval surgeon from Edinburgh,
- recommended fresh fruits and citrus juices to prevent scurvy

Scurvy R



- Madam De Coudary

- 'Manual on the art of Child Birth'
- Cleanest and most effective way to help a women through Labour'

Obstetrics



- Sir Humphrey Davy (1799) discovered Laughing gas (Nitrous Oxide).
- Had pain relieving properties but did not make patients completely unconscious

Anaesthesia



The structure of the human body was almost fully known, due to new methods of microscopy and of injections. Even the body's microscopic structure was understood.

MEDICINE IN 18th CENTURY

The Scratch that Saved a Million Lives: The Discovery of Vaccines



Edward Jenner, Pupil of John Hunter, invented the world's first vaccine for smallpox in 1789. Jenner inoculated James Phipps with cowpox, a virus similar to smallpox, to create immunity to **SMALL POX**.



and Pseudo Scientific Doctrines Other disciplines

PHRENOLOGY

Propounded by [Franz Joseph Gall](#), Contours of the skull is a guide to an individual's mentality and character traits.

Mesmerism

A belief in "animal magnetism" sponsored by [Franz Anton Mesmer](#),

Samuel Hahnemann

- The originator of homeopathy
- Treatment Involves administration of minute doses of drugs



Even in the 18th century the search for a simple way of healing the sick continued. Jenner is said to have saved more lives than the work of any other human being.

MEDICINE IN 19th CENTURY

PHYSIOLOGY



- Johannes Müller, professor at the University of Berlin
- Established Physiology as a distinct science



- Illustrious Pupils of Muller
- Hermann von Helmholtz
- Rudolf Virchow



Deathblow to Galen
4 humours theory

- Virchow's work published in 1858, gave the deathblow to the outmoded view that disease is due to an imbalance of the four humours.



- Claude Bernard, carefully planned experiments
- Role of pancreas in digestion,
- Presence of glycogen in the liver,
- vasomotor nerves
- Concept of Internal Milieu

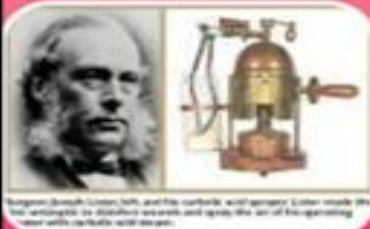
Germ Theory- Discovery of Germs and How They Cause Disease – 1860s



Process of Pateurisation

- French chemist Louis Pasteur established the science of bacteriology
- Discovered Rabies Vaccine

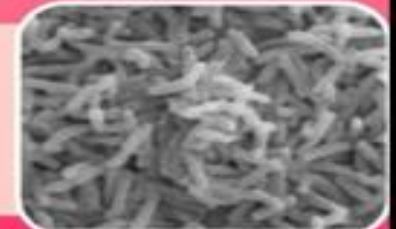
- Another Pioneer Robert Koch, showed how bacteria could be cultivated, isolated, and examined
- discovered M. tuberculosis, in 1882, and Vibrio Cholerae



- In 1870s, developed practical applications of the germ theory of disease.
- use of carbolic acid (Phenol) as an antiseptic.

- Germ Theory: Most spectacular overarching medical advance of the 19th century

- Viruses were discovered in 1890



Portrayal of the history of medicine becomes more difficult in the 19th century. Discoveries multiply, leading trends in modern medical thoughts are observed

MEDICINE IN 19th CENTURY

Discoveries in the field of Anaesthesia

1800

No real pain relief or knowledge of germs or antiseptics.



- 1846 – William. T. G. Morton,
- For the Relief of Unbearable Pain: Discovery and use of Ether during Surgery



1847

Prof. James Y Simsons discovered chloroform's anaesthetic property

Commendable Changes which improved Public Health and Patients stay in hospital

Stethoscope



In 1816 René Laënnec, a native of Brittany, who practiced medicine in Paris, invented a simple stethoscope, or *cylindre*.

REDCROSS ORGANISATION-1864



1850s
Nursing starts to improve.
(Florence Nightingale)

CHOLERA SAVED CIVILIZATION

- The Discovery of Sanitation
- First Modern Epidemiological Study in Manchester, UK, 1854
- John Snow identified that cholera was transmitted by the ingestion of water contaminated by feces.



Leading trends in modern medical thoughts started appearing in the Horizon.
Antisepsis and Anesthesia placed surgery on an entirely new footing.

MEDICINE IN LATE 19th CENTURY

Dawn of Radiology



I'm Looking Through You: The Discovery of X-Rays. Wilhelm Conrad Röntgen 1895

New Field of Psychiatry



Sigmund Freud was an Austrian neurologist and the founder of psychoanalysis.

Understanding of Parasitology



1897, Ronald Ross, a British officer in the Indian Medical Service, demonstrated that malaria parasites are transmitted via mosquitoes



- In 1877, Patrick Manson, showed in China that embryos of the Filaria worm can cause elephantiasis and it is transmitted by the mosquito.
- In 1881, In Cuba, Carlos Finlay expressed the view that yellow fever is transmitted by the Stegomyia mosquito.

The tremendous increase in scientific knowledge during the 19th century radically altered and expanded the practice of medicine. To uphold the quality of services, public and professional bodies to govern the standards for medical training and practice were established.

MEDICINE IN 20th CENTURY

From Ancient Molds to Modern Miracles: The Discovery of Antibiotics



In 1907, **Paul Erlich** introduced chemotherapy (chemicals that selectively destroy micro organisms, without causing damage to the host) systematic prophylactic **BCG vaccine**



In 1941, Due to World War II, Mass scale production was done in US instead of UK



Blood Grouping

Landsteiner described ABO Compatibility and A,B,AB & O Blood group.
• This led to first successful blood transfusion.



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



In 1943, Streptomycin was Discovered by Selman A. Waksman
He coined the term 'Antibiotic'



In 1940s, Florey & Chain helps in purification of penicillin from fermentation broth



In 1932, Gerhard Domagk found out that the sulfonamide Prontosil to be effective against streptococcus,

Endocrinology Begins

- 1905- Ernest H. Starling, introduces the term Hormones
- George Redmayne Murray treated myxedema () with an extract of the thyroid gland.
- 1922- Banting & Best discovered Insulin

Immunology

- 1906 August von Wassermann gave his name to the blood test for syphilis
- 1908 the tuberculin test was Introduced

Steady progress was made in the isolation, identification, and study of the active principles of the endocrine glands. Discovery of microorganisms, antibiotics, Hormones and vaccines – led to disappearance of fatal epidemics of the past and changed the facet of healthcare.

MEDICINE IN 20th CENTURY



Surgical and diagnostic techniques were developed to cure once fatal conditions:
Organ transplants 1954
Limbs reattached
Test tube babies 1978
Amniocentesis
Implanted first artificial heart



Second half of 20th Research topics

- Oral antidiabetic therapy
- Ionizing radiation and leukaemia
 - Sacharin and bladder carcinoma
 - Thalidomide effects
 - Estrogen supplementation and endometrial cancer
 - breast cancer
 - Passive smoking
 - HIV/AIDS 1983 identified
 - Risk factors for accidents



New machines were developed:

Kidney dialysis machine
Heart lung machine
Computerized axial tomography (CAT) scan

1980 – WHO announces that smallpox is eradicated.

1996- Dolly the sheep becomes the first mammal cloned from an adult cell (dies in 2003).

Medicines for the Mind:
The Discovery of **Drugs for Madness, Sadness, and Fear**

Lithium appears to market
1950

Breaking God's Code: The Discovery of Heredity, Genetics, and DNA 1953

James Watson and Francis Crick at Cambridge University described the structure of the DNA molecule.

Further progress in medicine, social sciences, technology and economy - led to increased life expectancy in wealthy populations, and change in morbidity and mortality patterns

MEDICINE IN 21st CENTURY



2000- First draft of human genome is announced; the finalized version is released three years later.



2006 - A "mini-liver"—the size of a small coin—is generated from human cord blood stem cells by doctors at Newcastle University, U.K.



2007 - Scientists discover how to use human skin cells to create embryonic stem cells.



2014 - The FDA approves the first human clinical trials in the United States for a wearable artificial kidney designed by Blood Purification Technologies Inc. out of Beverly Hills, California.



2015 -In March, DNA from an extinct woolly mammoth is spliced into that of an elephant. Scientists then successfully use the "revived" DNA to sequence the mammoth's complete genome.



2016 -The success of an first-time experimental surgery will determine future availability for U.S. cancer patients and veterans with injuries to the pelvic region. On May 8, 2016, a man named Thomas Manning is the first man to receive a penis transplant at the Massachusetts General Hospital. Manning's recovery from the surgery is going well

FUTURE TRENDS IN MEDICINE

- **Nanotechnology in medicine** involves applications of nanoparticles currently under development, that involves the use of manufactured nano-robots to make repairs at the cellular level

Nano Medicine



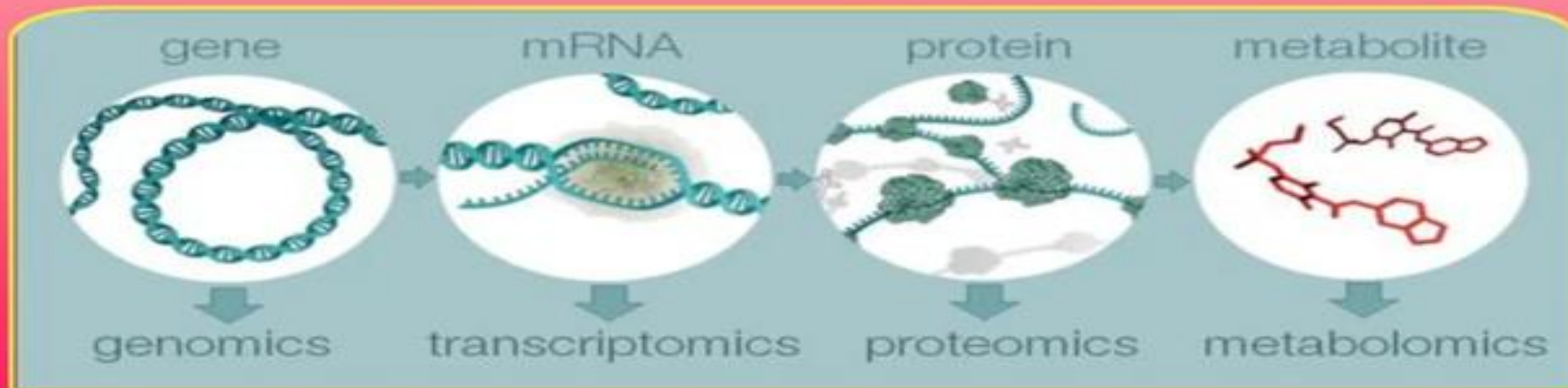
- Stem cells have tremendous promise to help us understand and treat a range of diseases, injuries and other health-related conditions

Stem Cell Research

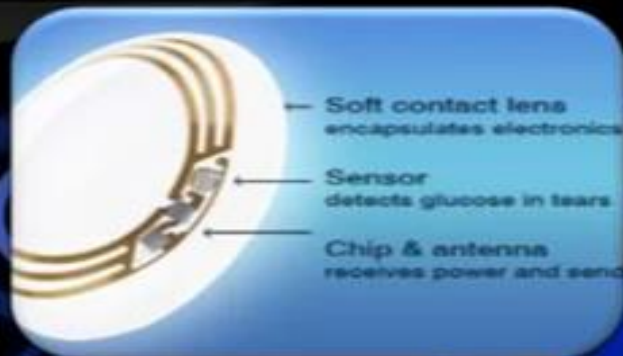


- **medical** decisions, practices, interventions and/or products being tailored to the individual patient based on their predicted response or risk of disease.

Personalised Medicine



TECH TRENDS IN MEDICINE



Soft contact lens
encapsulates electronics

Sensor
detects glucose in tears

Chip & antenna
receives power and send

Augmented reality:

The digital contact lens patented by google aims to change the course of diabetes management by measuring blood glucose levels from tears.



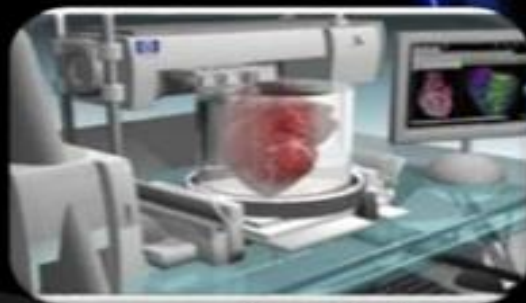
Artificial Intelligence:

Creating Digital selves based on neurological information. It means we could upload our minds to a computer and live on in a digital form.



Cyborgs: Cybernetic Organism

Cyborgs will be able to restore function or enhance abilities due to the integration of some artificial component or technology



Medical 3D printing

It will destroy and re-design the whole pharmaceutical world, but regulation will be a huge challenge. Bionic ears and simpler organs will be printed at the patient's bedside.



Gamifying behaviour change

Adherence and compliance pills as a pill bottle that glows blue when a medication dose should be taken and red when a dose is missed; or tiny digestible sensors that can be placed in pills and can transmit pill digestion data to physicians and family members.

TECH TRENDS IN MEDICINE



New diseases like Virtual PTSD

New types of diseases will appear due to the excessive use of virtual reality solutions in gaming and other industries including healthcare. E.G.,: virtual post-traumatic stress disorder , Addiction.



Real-time diagnostics

With the intelligent surgical knife (iKnife), the vaporized smoke is analyzed by a mass spectrometer to detect the chemicals in the biological sample to identify whether the tissue is malignant in Real Time.



Holographic data input

No hardware will be needed to add data to a laptop as screens and keyboards will be projected on the wall/table. Only small projectors will be needed, while the data will be stored exclusively in the cloud.



Crowdsourcing through Social Media

Social media has the potential to become a huge "mind machine" making it possible to transmit, share, crowdsource and store medical pieces of information either for e-patients or medical professionals



Multi-functional radiology

One multi-functional machine will be able to detect plenty of medical problems, biomarkers and symptoms at once.

Choose and study
the History of Medicine

We are waiting for you!!!