Avicenna (Abu Ali Al Hussein Ibn Sina) also called the Prince of Medicine

He was preoccupied by various domains (poetry, music, mathematics, theology, astronomy, geography, logic)

He wrote more than 100 medical texts.

Canon medicinae – synthesis of its own medical and clinical experience, in 5 parts:

-General problems – anatomy, physiology, dietetics, hygiene, ethics.

-Simple remedies – over 700 remedies (vegetal, mineral, animal), classified according to their effects.

-Internal diseases – presented in topographical order (head - feet), specifying symptoms, clinical aspects, causes, notions of physiopathology and anatomopathology, diagnosis, prognosis and treatment,

-External diseases – surgical diseases, fever and eruptive diseases.

-Composed remedies – numerous recipes grouped by various diseases.

Fundamental treaty for the medical education of physicians, used until the XVIIIth century.

Medicine's Poem – comprising a theoretical part and a practical one – a synthesis in verses of Canon Medicinae.

Avicenna's contribution to the progress of medicine:

He correctly described, from a clinical point of view, multiple affections (gastric ulcer, pyloric stenosis, infectious and parasitic diseases)

He differentiated between central and peripheral facial paralysis

He recommended boiling water as a prophylactic measure

He foreseen the antiseptic action of alcohol (washing wounds with wine)

Andreas Vesalius

Son of a pharmacist from Brussels.

He studied medicine at the Universities of Lowein, Paris and Padua.

At the age of 23, he becomes an anatomy professor at Padua University.

Major works:

1538 - Tabulae Anatomicae (Anatomical Tables) – the first anatomy atlas for students in medicine.

1543 - De Humanae Corporis Fabrica (On the Fabric of the Human Body) – treaty in 7 volumes, with 300 de engravings and drawings. 7 volumes:

Bones and cartilages

Ligaments and muscles

Vessels

Nerves

Organs of digestion and urogenital

Heart and respiratory organs

Brain and sensitive organs

Contributions in the development of modern anatomy:

He perfected the technique and dissection instruments

He performed simultaneous dissections on 2-3 bodies, in order to establish differences between observed structures and anatomical variations – the basis of comparative anatomy

He used a precise methodology to teach anatomy – a skeleton, anatomical drawings.

He correlated anatomical structures with their body functions

He named every new anatomical structure and correlated already known structures with their previous Greek and Arab names, thus creating an anatomical dictionary.

Girolamo Fracastoro

Practicing physician, researcher, he dedicated his career in studying various epidemics from the beginning of the XVIth century.

He wrote a series of fundamental medical treaties, regarding contagious diseases:

Siphilae sivae morbus gallicus (Syphilis or Galic disease) – Venice 1530

Written as a mythological poem in neo-Latin verses

He provides a complete description of initial symptoms, diagnosis, evolution and treatment with vapors of mercury and wood of guaiac.

In another book - De contagionae et contagiosis morbis (On Contagion and Contagious Diseases") – Venice, 1546

He proposed the hypothesis that infectious diseases are spread by invisible beings, named "seminaria morborum" (seeds of disease) which enter the human organism by various ways: respiratory, digestive, through open wounds, and then attach themselves to the organs.

Thus, after approximately 2000 years, Hippocratic and Galenic miasma theory is contradicted

Contributions:

He defined infection as any disease that can be transmitted from one person to another.

He classified the way they are spreading as: direct (through direct contact), indirect (by touching a sick persons' objects) and distant (through air, dust).

He defined a causal connection (favoring factor) between natural phenomena and social catastrophes (earthquakes, floods, wars) and different epidemics.

He envisioned, for the first time, specific anti-epidemic measures (prophylaxis)

He correctly described, from a clinical and epidemiological point of view, the plague, tuberculosis, typhus and smallpox.

Ambroise Paré

The most famous surgeon of Renaissance.

He started as a barber apprentice.

He studied medicine in Hotel Dieu Paris, specializing in surgery.

In 1536, he becomes a master barber-surgeon and he joins Rene de Montejan – a general colonel in French infantry, during their campaign in Italy.

As a military physician, he participated in various military campaigns, where he replaced amputation and wounds cauterization in haemostatic purpose, with vascular ligature.

In 1554, he becomes a Master in Saint-Come College of Paris, after passing his Latin exam.

He developed a simple bandage for war wounds, made of rose oil, eggs and turpentine, replacing hot elderberry oil poured in wounds.

He wrote an obstetrics treaty, being considered the first modern obstetrician.

He was also interested in orthopedics, creating, when needed, mechanical prosthetics

He invented new surgical instruments and he perfected several surgical procedures.

He is the founder of ballistics (field of legal medicine), explaining how to extract the bullet from a gunshot wound.

He wrote the first European treaty of legal medicine – Treaty about embalming – 1575.

Paracelsus

Paracelsus (Philippus Aureolus Theophrastus Bombastus von Hohenheim) – one of the most famous representative of Renaissance.

Suisse of German origin, physician, philosopher, alchemist, theosopher, wise man and pilgrim

He become doctor in medicine in Ferrara.

He considered the human body as a micro-cosmos in which is actively reflected the macro-cosmic Universe.

He claimed that diseases are imbalances of the chemical order of the body, which is made from condensed vapors.

He claimed that the human body is a chemical compound, and digestion is the dissolution of food.

He founded iatrochemistry – balance between disease and health; imbalance of chemical substances within the body – a modern form of Hippocratic humors theory.

According to iatrochemistry principles:

Diseases may be cured with chemical substances (remedies, tinctures, potions) in order to re-establish the chemical balance of the human body

He considered that the main elements that formed the human body are: salt, sulphur and mercury.

He was the first to warn that medication may be toxic, when dosage and administration indications are not respected.

He insisted for the creation of laboratories in which scientists could study the chemical composition of the body and the alteration that occur in diseases, their etiology, in order to establish a correct diagnosis.

He recommended the use of sulphuric acid combined with alcohol as anesthetic – technique improved in the XVIIIth-XIXth centuries

He was the adept of spagyric medicine – combining alchemy with astrology and clinical observation of the patient.

He clinically described 9 professional diseases: miners' asthma (pneumoconiosis), arsenic, lead, mercury intoxications

He founded modern balneotherapy by studying the chemical composition of mineral waters and their use in therapeutic purposes.

William Harvey

He discovered and explained how the blood flows through blood vessels. A closed circuit in which the heart serves as a pump.

He studied medicine in England and Italy (Padua) where he was Felicio D'Aquapendente's (1600 - 1602) student.

Felicio d'Aguapendente – discovered venous valves (1574), but he explained blood circulation based on Galenus humors theory.

1615 □ he becomes a professor of anatomy and surgery in Royal College of Surgeons of London

He conducted numerous experiments (dissections, vivisections), vascular ligatures, explaining blood circulation with the help of scientific methods:

Modeling method: he studied how semi-fluid liquids flow through elastic vessels (in vitro experiment)

Quantitative method: he conducted o series of measurements calculating among others systolic blood flow and the volume of the heart.

Applying the laws of mechanics (discovered by Galileo Galilei): for studying human physiology.

Inductive method (enounced by Francis Bacon): in which phenomena's are analyzed from particular to general and from facts to theory – contrary to Aristotel's deductive method.

He published "An Anatomical Exercise on the Motion of the Heart and Blood in Living Beings" (Exercitatio Anatomica de Motu Cordis et Sanguinis in Animalibus) – Frankfurt am Main (1628) – 72 pages

Heart was considered a muscular pump

He correctly describes the small and big circulations

He explains the role of the venous valves

He claimed that the connection between veins and arteries is realised through a series of fine anastomoses called pores.

By applying the laws of mechanics and hydrodynamics in the study of human physiology he founded iatromechanics.

In 1651, he publishes “On Animal Generation” (Exercitationes de generatione animalium) – showing also an interest in embryology, affirming for the first time in human history that every living organism originates in an egg–epigenetic doctrine.

Thomas Sydenham

He was an exceptional clinician, so-called “The New Hippocrates”.

He described and individualized numerous diseases, insisting upon their clinical aspects:

chorea, scarlet fever, gout

psychiatric diseases: hysteria, mania

convulsive diseases: epilepsy, convulsive cough

He relied upon Hippocratic therapeutics (nature has the cause and remedy of various diseases).

He recommended physical exercises for the treatment of tuberculosis (consumption)

He extended the use of opium for therapeutic purposes – opium tincture in solution “laudanum liquidum sydenhami”

Regarding epidemiological research::

He accurately described a series of infectious diseases – childhood eruptive fevers (rubeola)

He recommended the spread of healthy people when new cases of plague were diagnosed.

Claude Bernard

the founder of experimental medicine; he successfully imposed his experimental method regarding medical scientific research.

His thesis published in 1865 “Intriduction in the study of experimental medicine” (Introduction à l’étude de la médecine expérimentale) – is considered the birth certificate of modern physiology.

He conducted numerous systematic studies on animals, discovering:

glycogenolysis and glycogen functions of the liver

the role in digestion of salivary glands, pancreas and bowel

he established the relation between the central nervous system and the glucidic metabolism.

He conducted numerous systematic studies on animals, discovering:

he demonstrated the existence and role of vasomotor nerves in the physiology of living organisms

he studied internal secretion glands – he was the founder of endocrinology

he defined the concept of homeostasis – the internal medium has a constant compositions, which assures the continuity and balance of vital functions

he performed pharmacological and toxicological studies, discovering the effects of curare, strychnine and carbon monoxide.

Rudolf Ludwig Carl Virchow

professor of anatomopathology in Wurzburg and Berlin - he promoted the use of microscope in the study of pathological processes

he considered that the cell represents the morphological element that forms the entire living tissue

he wrote “Cellular pathology” (1858, Berlin) – in which he explained diseases through cellular level alterations. - “every cell originates from another cell”

He conducted numerous studies:

he discovered leukemia, thrombosis, embolic diseases

he described arterial diseases, bile pigments, fibrin

he described the hypertrophy of supraclavicular ganglia in gastric neoplasm

he recommended that neoplastic diseases diagnosis should be confirmed through microscopically analysis of small tissue samples surgically prelevated from the tumor.

Louis Pasteur

in 1878 he presented his work “Microbes organized, their role in fermentation, putrefaction and the Contagion”

He recommended boiling of surgical instruments, robes, bandages, for at least 30 minutes at 100oC

He developed the microbial theory of infectious-contagious diseases – alongside the German physician Robert Koch (1843 - 1910), being considered founders of microbiology

He studied alcoholic, lactic fermentations, demonstrating that the theory of spontaneous generation is false (spontaneous apparition of germs in fermentation and putrefaction processes)

He studied contagious diseases in animals and humans, managing to observe, with the help of a microscope, various microbes which he described and used for developing various vaccines.

1861 – he discovered the first anaerobe microbe – Pasteurella avium.

1878 – he isolated the microbe of aviary cholera, which he used for the first vaccine (1880)

1881 – he demonstrated the role of anthrax in the etiology of the disease, managing to develop the associated vaccine

1880 – 1885: together with his colleague Emile Roux (the one who developed the vaccine), he researched preventive vaccination for rabies.

Robert Koch

Co-founder of bacteriology:

1877 – he isolated the anthrax bacilli

1882 – he isolated the tuberculosis bacilli (1905 – he is awarded the Nobel prize in medicine)

1883 – he isolated the cholera vibrio.

He introduced new methods to cultivate and isolate microbes on solid environments (agar - agar) and he emphasized them by using specific staining procedures.

1878 – 1884: “Koch’s Postulates” – valid also today in establishing the etiology of infectious diseases:

The microbial agent must be isolated from all organisms that presented that specific disease.

It can be isolated and grown on culture media

It can produce the same disease after inoculation, in lab animals

After isolation from a sick animal, it can be grown again on a culture media.