Chapter: Introduction in study of pathophysiology
Chapter 1. Introduction in study of pathophysiology

1.1. Historical considerations

1.2. Pathophysiology in medical education

1.3. Health and disease concept
   1.3.1. Health
   1.3.2. Disease
Overview:

Pathophysiology - physiology of altered health.

Pathology (from the Greek pathos, meaning “disease”) + Physiology (from the Greek physis, meaning “movement”)

Pathophysiology deals on both the cellular, tissue and organ changes that occur with disease and affects body function. It also investigates the mechanisms of disease and provides the background for preventive medicine, diagnostic criteria and therapeutic protocols.

Understanding pathophysiology is essential:
- bridge between preclinical and clinical science
- interaction between disease and the animal body
- the core of clinical pathology
Chapter 1. Introduction to the Study of Pathophysiology

**Historical Consideration**

**Prehistoric Medicine**

**First Scientific Attempts** - Ancient Greek:  
- Hippocrates (460-370 BC) “pathos” & “ponos”  
- Aristotle (384-322 BC) dissected small animals  
- Galenus (129-216 AC) (who introduced experimentation into the study of healing)

**William Harvey** (1578–1657),  
“On the Motion of the Heart and Blood in Animals (1628)”

**Claude Bernard** (1813-1878, Paris),  
- basics of experimental medical science,  
**Walter B. Cannon** (1871-1945) - concept of homeostasis, “fight or flight” response
Chapter 1. Introduction in study of pathophysiology

Historical consideration

Johannes de Varandaeus, (1560–1617), Montpellier - “pathologic physiology”
August Friedrich Hecker (1763–1811), Prussia - First textbook in Pathophysiology
Louis Caillot (1819) - academic discipline: “Elémens de Pathologie generale et physiologie pathologique”
Karel von Rokitansky (1804–1878) Institute of General and Experimental Pathology in Vienna

British medical system / European medical system

Pathology in medical schools of USA and Canada – pathomorphological
massive migration into North America including great numbers of MDs fro Europe

SL Robbins (1915–2003), (since 4th Ed; 1974) “Pathology” to “Pathologic Basis of Disease”,
(now at 8th ed)

Many books entitled Pahophysiology / not in Veterinary Medicine!!!!

Translational Medicine (1990)

Clinical Pathology
Pathophysiology in medical education

Scientific / clinical approach

Biochemistry / Medical Genetics / Molecular Biology / Immunopathology / Bioinformatics / Biophysics

human / veterinary medicine

fundamental / clinical science

“On the contrary to common opinion, the Nature does not always act in an optimal way. Neither on cellular, nor on interpersonal levels we do not always know: what is worth to fight for…” (Selye 1936).
Pathophysiology in medical education

The organism is not “wise”,
-automated responses –

adaptive response / lesional
(ex cardiogenic shock)

clinical reasoning never can be constructed on the base of common sense!
(ex therapeutic approach in lactic acidosis)

clinical diagnosis should no be understood as an act of scientific research!
Health and disease concept

Health

WHO in 1948: “a state of complete physical, mental, and social well-being”

“ability of individuals to effectively respond to the demands of their environment”

Clinical criteria – absence of clinical signs

Laboratory criteria – laboratory parameters within normal limits for the species, sex, age etc. normal value: 95% distribution (mean ± 2 SD) for reference population
Health and disease concept

Disease

disease, sickness, illness

Dorland’s Medical Dictionary “any deviation from or interruption of the normal structure or function of any part, organ or system of the body that is manifested by a characteristic set of symptoms and signs”.

disease can be considered a cluster of signs, symptoms and laboratory findings linked by a common pathophysiologic sequence, induced by an etiological agent

General features of disease:
Etiology (single / plurifactorial, risk factors)
Pathogenesis – sequence of events
Morphological changes – gross / microscopical
Clinical manifestations – signs / symptoms, syndrome
Diagnosis – designation of the etiology and stage (presumptive diagnosis)
Health and disease concept

Disease

Clinical course – supra-acute, acute, sub-acute, or chronic

(1) latency period (preclinical stage, incubation) - Subclinical disease.
(2) clinical disease, - (3) end - recovery (complete or sequelae) or death

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