

INTRODUCTION TO PATHOPHYSIOLOGY



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PATHOPHYSIOLOGY

Pathophysiology is derived from two words i.e “Pathology and Physiology”.

- + **Pathology** is a branch of science primarily concerning the cause, origin and nature of disease.
- + The functional changes associated with different diseases and injury is known as **Physiology**.
- + Basically, Pathophysiology refers to the study of abnormal changes in body functions that are the causes, consequences of disease processes and how the body reacts to injury or fight off to diseases.

HOMEOSTASIS

Homeostasis is derived from two words i.e “Homeo means same & Stasis means standing or to maintain.

- + **Homeostasis** is any self-regulating process by which biological systems tend to maintain stability between the internal environment & external environment.

- + **Ex: Internal Environment:-**
 - Bp of the body
 - Ph of the body fluid
 - Body temperature
 - Oxygen & carbon dioxide level
 - Blood glucose level

- + **Ex: External Environment:-**
 - Air
 - Temperature

- Humidity
- Pressure

FEEDBACK MECHANISM

It is a form of regulation in which, body detect the changes in internal and external environment then it altered accordingly, is known as Feedback Mechanism.

It is further divided into two types:

- 1. Positive Feedback Mechanism**
- 2. Negative Feedback Mechanism**

Components of Feedback Mechanism:

- ✚ The Sensor, that detects the stress.
- ✚ The Control Center, that receives information from the sensor and send it to control the stress.
- ✚ The Effector, that receives the message from the control center and produces the response against the stress.

1. Positive Feedback Mechanism:

Positive Feedback Mechanism increases the changes or outcome. The reaction effect is enhanced so that it can happen much more quickly. In this form of feedback, the output of the system is enhanced.

Ex: The release of oxytocin from the posterior pituitary gland during labor is an example of positive feedback mechanism.

- ✚ Oxytocin stimulates the muscle contractions that push the baby through the birth canal.

- ✚ The contractions intensify and increase until the baby birth through the birth canal.
- ✚ When the stimulus to the pressure receptors ends, oxytocin production stops and labor contraction stop.

2. Negative Feedback Mechanism:

Negative Feedback Mechanism decreases the changes or outcome. It normalizes the things when they start becoming too extreme. In this form of feedback, the output of the system is decreases.

Ex: The thyroid gland is regulated by a negative feedback mechanism.

- ✚ (Thyroid releasing hormone)TRH hormone secreted by the hypothalamus stimulates the pituitary gland to release thyroid stimulating hormone (TSH).
- ✚ In turn, the thyroid stimulating hormone (TSH) triggers the thyroid gland to release its hormones.
- ✚ When the thyroid level increases, the hormones stop the secretion of thyroid releasing hormone (TRH) by the hypothalamus and secretion of thyroid stimulating hormone (TSH) by the pituitary gland by the negative feedback mechanism.



