Stress (Psychological stress)

• **In medical terms:**
  Stress is the disruption of homeostasis through physical or psychological stimuli.

• **Selye Definition:**
  Body’s physiological response to psychological and physical demands (stressors)
Stressors

• A **Stressor** is a stimulus or event that provokes a **stress response** in an organism.

• **Stressors can be categorized as:**
  - Acute × Chronic
  - External × Internal
  - Unpleasant × Pleasant *(Distress) (Eustress)*
  - Physical × Emotional *(Psychological; Mental)*
Common stressors

Both negative and positive stressors can lead to stress:

• Sensory: pain, bright light
• Life events: birth and deaths, marriage, and divorce
• Responsibilities: lack of money, unemployment
• Work/study: exams, project deadlines
• Personal relationships: conflict, deception
• Lifestyle: heavy drinking, insufficient sleep
• Early life exposure (e.g. child abuse)
• Lack of control over environmental circumstances, such as food, housing, health, freedom, or mobility.
Psychological Distress

Results from three types of experience:

1. Pressure
2. Conflict
3. Frustration
Special Stressful Events

• Serious Physical Illness
• Terminal Illness
• Bereavement
Components of the Stress Response

1. **Emotional** (Fear, Anxiety and Depression) accompanied by somatic changes

2. **Psychological** to reduce the potential impact of the experience:
   - Impaired recall and numbness
   - Coping strategies
   - Defense Mechanisms
Coping Strategies

1. **Adaptive:**
   - Avoidance
   - Working through problems
   - Coming to terms with situations

2. **Maladaptive:**
   - Substance abuse
   - Histrionic or aggressive behavior
   - Deliberate self-harm

3. **Culturally determined**
Individual’s Response to Stressors

Determined according to:

1. Physiological reactivity
2. Cognitive appraisal
3. Control

✓ Type A behavior
✓ Hostility
✓ Antagonism with others
STRESS SYMPTOMS

- Unusual heart beat (fast, pounding, irregular, etc.)
- Unusual breathing (fast, shallow)
- Restless feeling (feels like you have to move)
- Muscles feel tight or tens
- Frequent aches and pains
- Headaches
- Often get the flu or cold
STRESS SYMPTOMS

- Feels warm or hot when it isn't hot
- Sweat more than normal
- Dry mouth
- Nervous stomach (gas, diarrhea, constipation)
- Heartburn, Nausea,
- Loss/or increase in appetite
- Urinate more than normal
- Fatigue
STRESS SYMPTOMS

- Obsessive worrying
- Lack of concentration
- Memory loss
- Feeling self-consciousness, Shy, Lonely,
- Uncomfort, Irritability,
- seriousness Dissatisfaction,
- Fear, Anxiety, Anger, Panic
- Depressed mood, Unhappiness, Crying
- Insomnia
- Sexual problems
General adaptation syndrome (GAS)

A term used by Selye to describe the body's short-term and long-term reactions to stress.

❖ GAS involved two major systems of the body:
  ➢ the nervous system
  ➢ the endocrine (or hormonal) system.

❖ Three distinctive stages:
  ➢ Alarm reaction
  ➢ Resistance
  ➢ Exhaustion
Stage 1: Alarm reaction

❖ is the immediate reaction to a stressor. "fight or flight" response, which prepares the body for physical activity.

❖ This initial response can also decrease the effectiveness of the immune system, making persons more susceptible to illness during this phase.
Stage 2: Resistance (stage of adaptation)

- During this phase, if the stress continues, the body adapts to the stressors.
- Changes at many levels take place in order to reduce the effect of the stressor.

Example, if the stressor is starvation, the person might experience a reduced desire for physical activity to conserve energy, and the absorption of nutrients from food might be maximized.
Stage 3: Exhaustion

When stress continued for some time the body's resistance to the stress may gradually be reduced.

- The immune system, and the body's ability to resist disease, may be almost totally eliminated.
- Patients may develop heart attacks or severe infection due to their reduced immunity.

Example, a person with a stressful job may experience long-term stress that might lead to high blood pressure and an eventual heart attack.
Neurochemistry and Physiology of GAS

- Stress activates the sympathetic division of the ANS and release of epinephrine, and cortisol.
- Sympathetic output produces the fight-or-flight response, causing the body to divert blood flow to large muscles.
- Less blood flows to the digestive system and other organs, producing dry mouth, motor agitation, sweating, pallor, enlarged pupils and, insomnia.
**Neurochemistry and Physiology of GAS**

- Stressors can cause continual sympathetic activation with very little opportunity for the parasympathetic to activate.
- Parasympathetic activation allows the bowel and other non-muscle organs receive good blood-flow, the pupils constrict, and the glands all function well and secrete their various compounds.
- Absence parasympathetic activation leads to poor digestion and may lead to poor healing and organ function.
Neurochemistry and Physiology of GAS

❖ The body reacts to stress first by releasing:
  ➢ catecholamine hormones (epinephrine and norepinephrine)
  ➢ glucocorticoid hormones (cortisol).

❖ The hypothalamic-pituitary-adrenal axis (HPA) balances hormone releases from the adrenal medulla, and from the adrenal cortex.
Psychoneuroimmunology (PNI)

- PNI investigates the relations between the psychophysiological and immunophysiological dimensions of Man.
- PNI also involves endocrinology and is sometimes referred as: psycho endoneuro immunology (PENI).
- Stress can significantly affect many of the body's immune systems.
- Stress is thought to affect immune function through emotional and/or behavioral manifestations (such as anxiety, fear, tension, anger and sadness) and physiological changes (heart rate, blood pressure. Sweating).
Psychoneuroimmunology (PNI)

• Stressful events trigger cognitive and affective responses which, in turn, induce sympathetic nervous system and endocrine changes, and these ultimately impair immune function.

• Health consequences include rates of infection, HIV progression, and cancer incidence and progression.

• These changes are beneficial if they are of limited duration, but when stress is chronic, the system is unable to maintain equilibrium or homeostasis.
Psychoneuroimmunology (PNI)

- **Stressful events** (Acute, Short-term and Long-term) in healthy adults revealed consistent stress-related immune changes:
  - Increases in numbers of total white blood cells
  - Decreases in the numbers of helper T cells, suppressor T cells, and cytotoxic T cells, B cells, and Natural killer cells (NK)

- Antidepressants seem to exert beneficial effects by decreasing Interferon-beta (IFN-beta) release or augmenting NK activity in depressed patients.
Determinants of GAS

- overall health and nutritional status,
- sex,
- age,
- ethnic or racial background,
- level of education,
- socioeconomic status (SES),
- genetic make up,
- others....
Pathological Impact of Stress

1. **Psychiatric disorders:**

2. **Stress disorders:**
   - Acute Stress disorder
   - Post traumatic stress disorder
   - Adjustment disorder

3. **Physical disorder (Psychosomatic disorders)**
Stress reduction strategies

- Generally fall into one of three categories:
  - avoiding stressors
  - changing one's reaction to the stressor
  - relieving stress after the reaction to the stressor

- Many mainstream as well as complementary or alternative strategies for stress reduction:
  - exercising
  - listening to music,
  - massage
Selye Approach to Stress
(living wisely in accordance with natural laws)

- Adopting an attitude of gratitude toward life.
- Acting toward others from altruistic motives.
- Retaining a capacity for wonder and delight in the genuinely good and beautiful things in life.
- Finding a purpose for one's life and expressing one's individuality in fulfilling that purpose.
- Keeping a healthy sense of modesty about one's goals or achievements.
THANK YOU