

# Stress

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# 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 X Chronic
  - External X Internal
  - Unpleasant X Pleasant  
(*Distress*) (*Eustress*)
  - Physical X 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