



# STRESS AND ITS IMPACT ON HEALTH

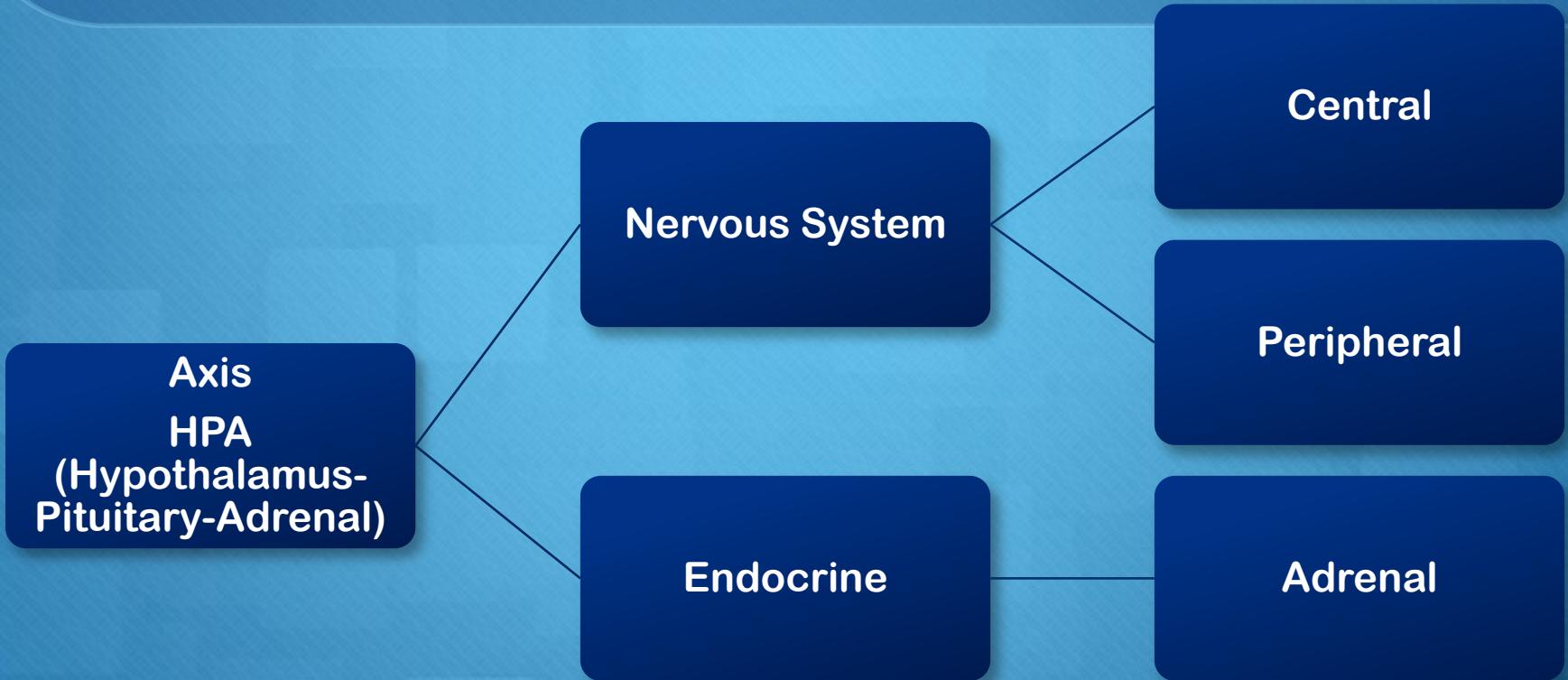
# Stress

- **Definition:**
- **Unspecific response of the organism to any demand placed upon it.**
- **Physiological and psychological responses of the body to a stimulus (stressor) that can be an event, person, object.**

# Stress

- God created us with automatic defense mechanisms aimed to effectively face real emergency situations that can adversely affect our well being (real stressors).

# Physiological components of stress



# Stress physiology

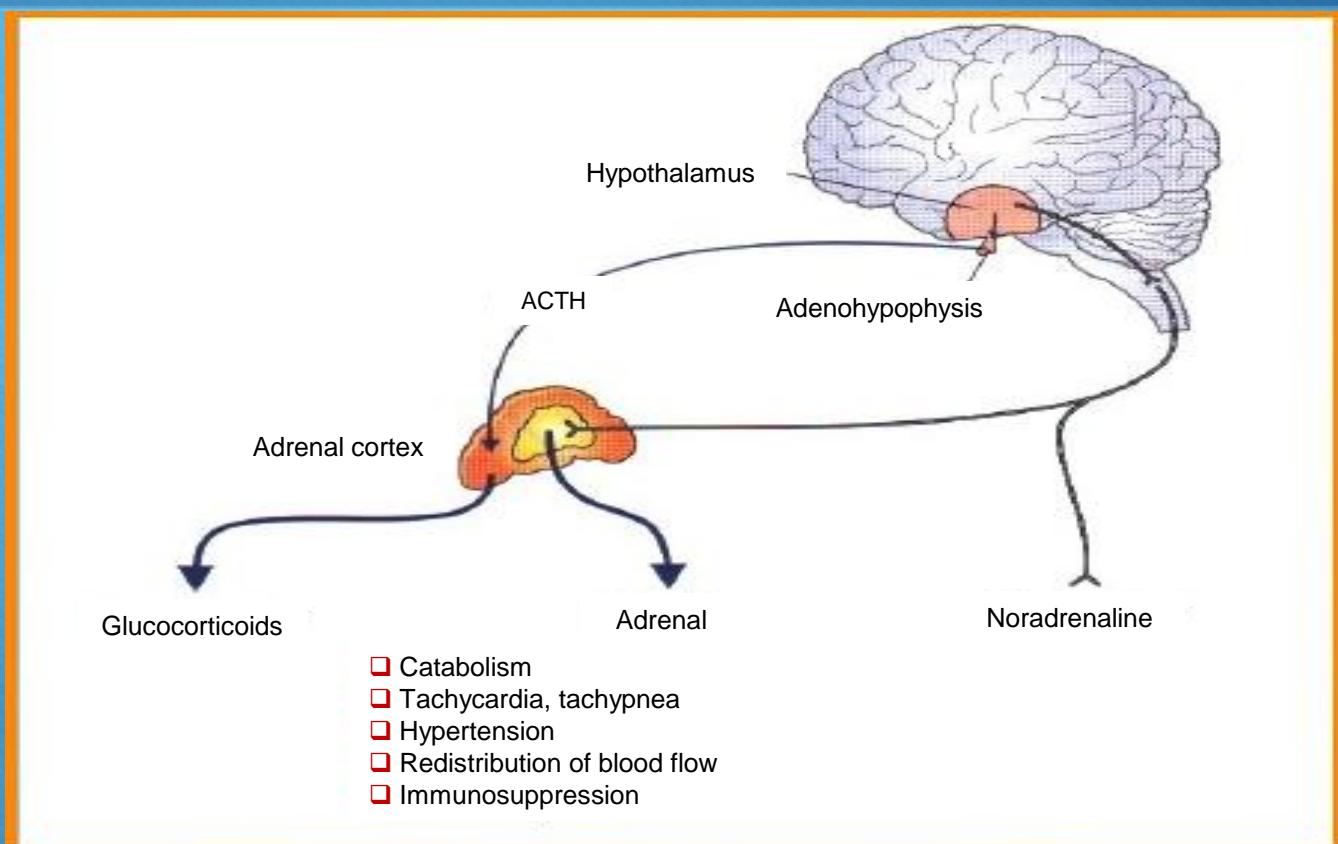
- The primary function of the HPA axis (hypothalamus pituitary adrenal) is to conserve metabolic homeostasis and mediate the endocrine stress reaction.
- ACTH (primary stress hormone) induces steroidogenesis to maintain the proliferation and function of the adrenal cells.

# ACTH physiology

## Factors that regulate ACTH

- CRH
- The concentration of plasma free cortisol
- Stress
- The waking-sleep cycle
- ACTH and cortisol also increase by eating

# Stress response mediated by the hypothalamus and SNA



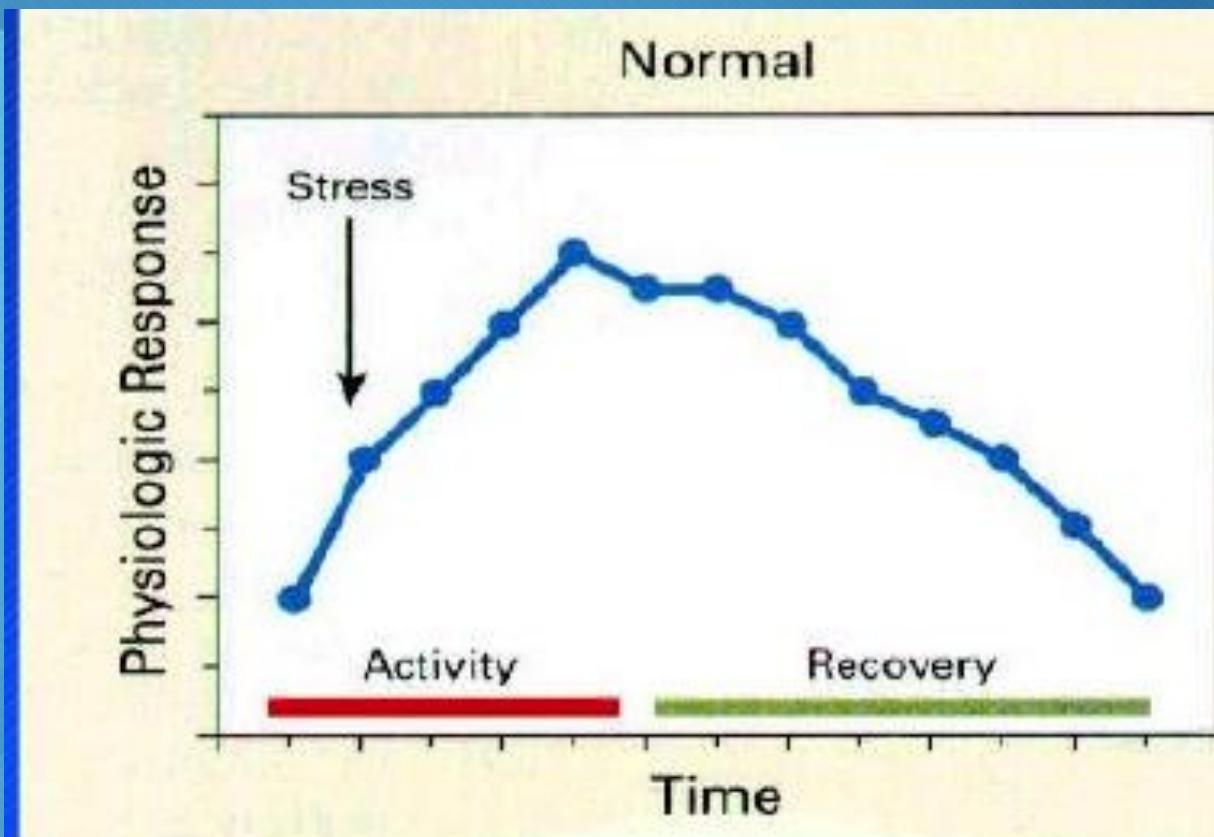
# Functions of cortisol

- Their actions are aimed at facilitating the production of glucose, reducing the remaining activities which do not intervene in this process
- Increase plasma glucose
- Decreases glucose uptake in the tissues
- Favors gluconeogenesis in the liver
- Protein catabolism
- Mineralocorticoid-like properties
- Inflammatory properties

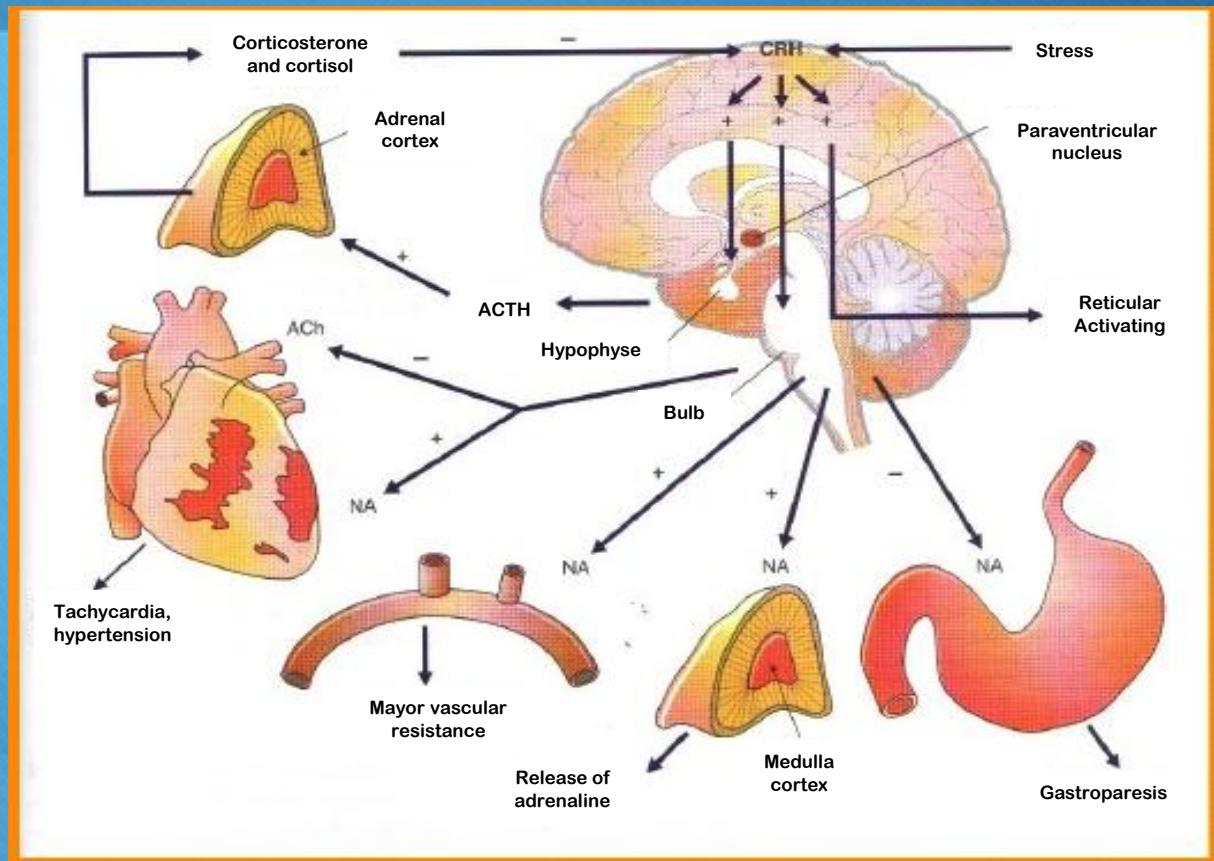
# Functions of cortisol

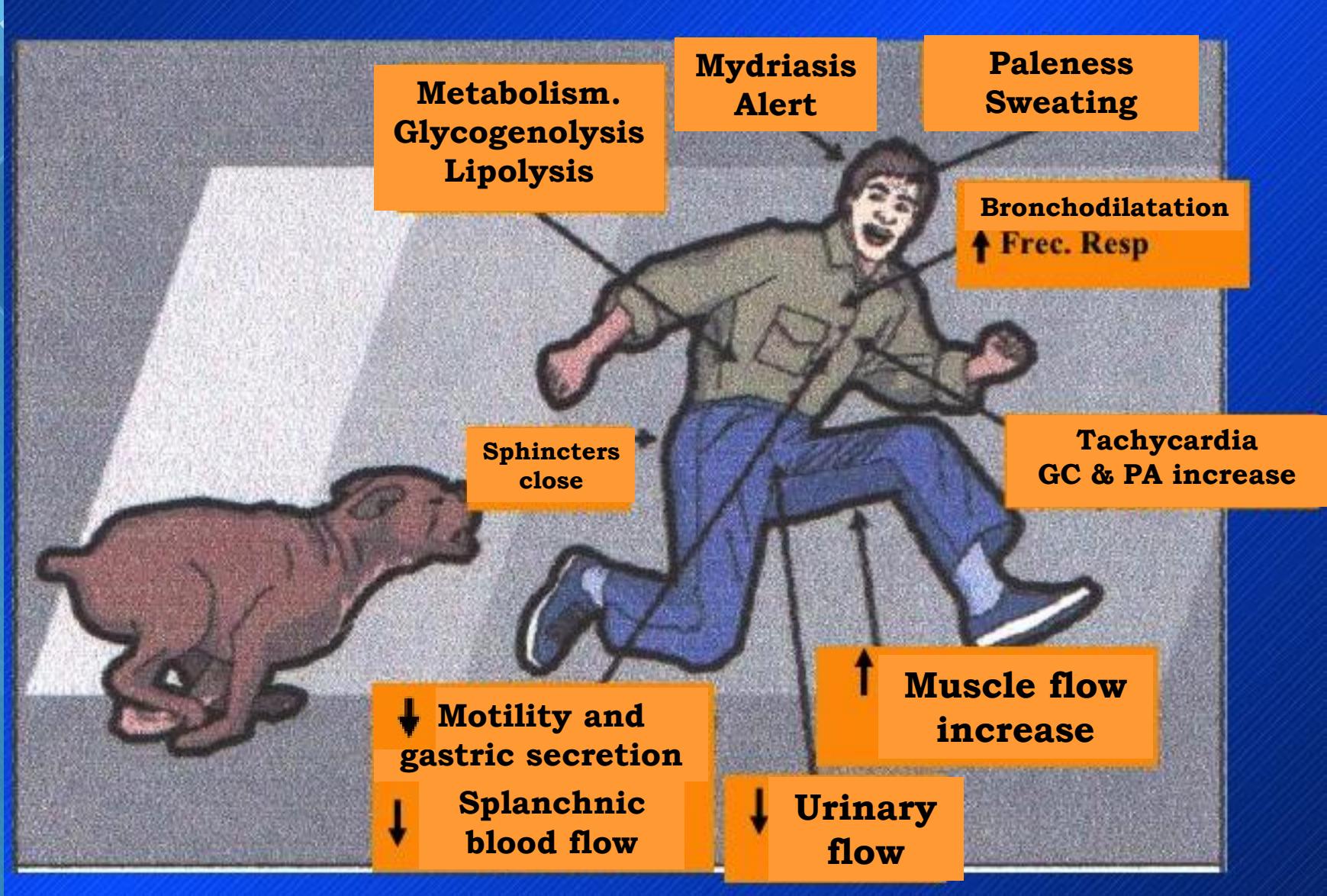
- The reasons are not well known of why the elevation of glucocorticoids protects the body against stress, but when there is a deficit, these situations can cause hypotension, shock and death.

# Body's response to stress (beginning and end of the response)



# Physiological stress response





# Types of stress

- Eustress (positive stress): Represents the type of stress where the individual interacts with his stressor but keep an open mind and prepares the mind and body for optimum function.

# Types of stress

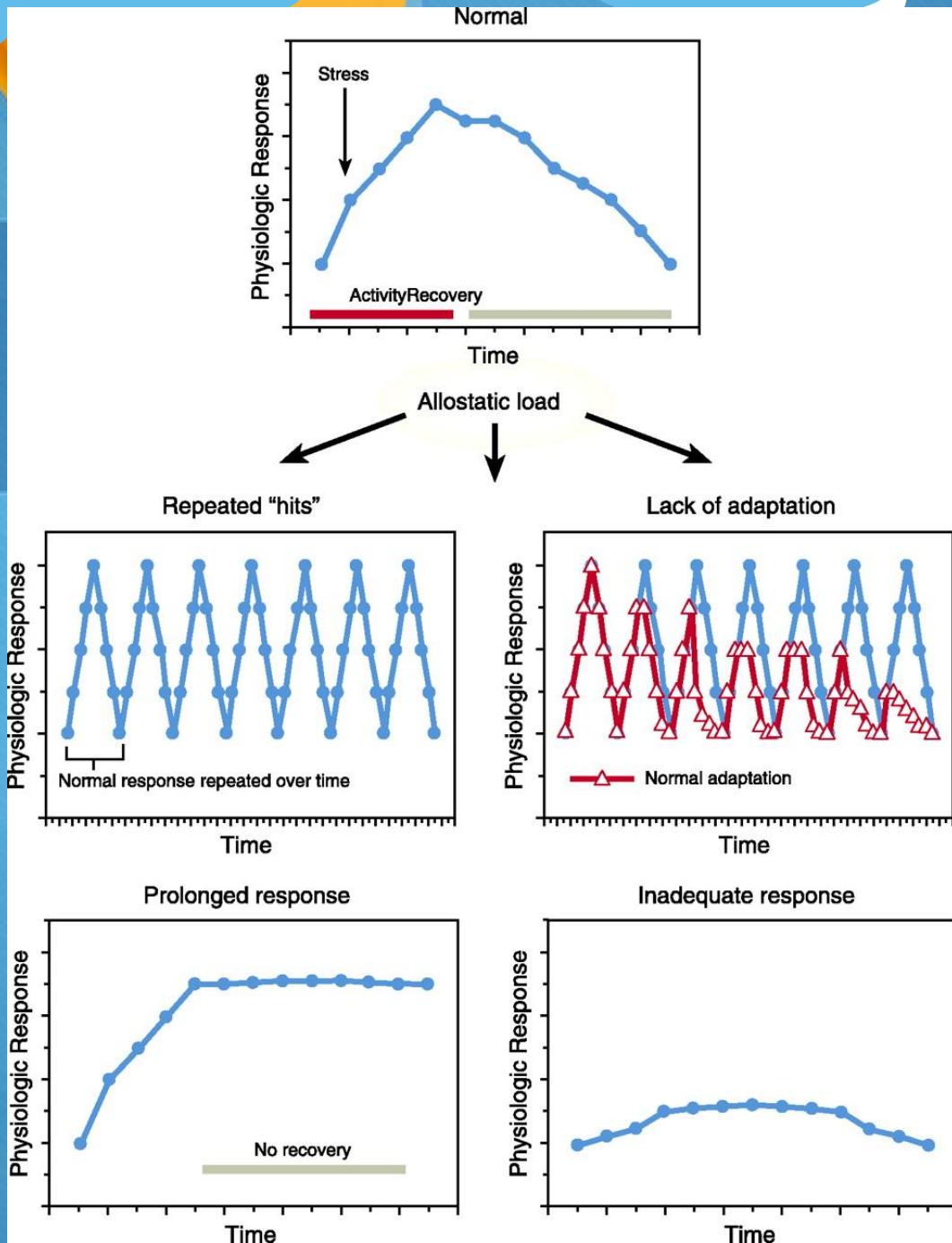
- Distress: damaging or unpleasant stress. This type of stress causes an inassimilable work load that eventually causes a physiological and psychological imbalance, which ends in decreased productivity of the individual, the onset of psychosomatic diseases and accelerated aging.

# Modern Stress

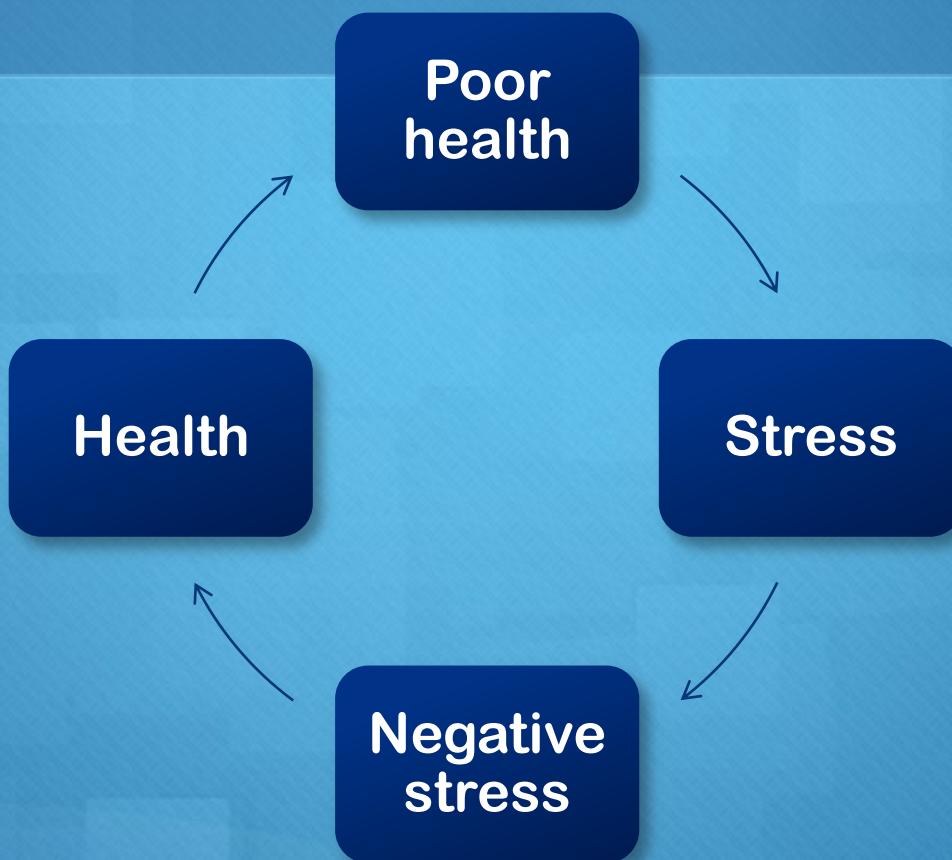
Meaning of events in our life: betrayals, decisions, work shifts, financial problems, personal losses, retirement, etc.

Overexcitement

Neuroendocrine alterations; emergence of diseases



# Stress vs health



# Diseases associated with stress

- Headaches (Tension) and muscle contractions:
- Mediated by sympathetic stimulation (adrenaline and noradrenaline) produces muscular contraction.

# Diseases associated with stress

- High blood pressure:

Mediated by adrenaline / noradrenaline, in blood vessels vasoconstriction, in myocardial tachycardia and hypertension.

Probable mineralocorticoid effect of glucocorticoids.

# Diseases associated with stress

- Diabetes:

Mediated by the continuous elevation of cortisol  
and its effects on glucose metabolism.

# Diseases associated with stress

- Gastrointestinal: IBS (Irritable Bowel Syndrome)
  - Sympathetic adrenergic / cholinergic effect produces constriction and dilatation in abdominal viscera respectively.
  - Reduced tone and peristaltism.

# Personality

## Type A

- Negative Stress
- High sense of urgency
- Impatient
- Obsession with always being on time
- Competitive at work and recreational areas
- Avid public recognition
- Restlessly moves knees or fingers
- 3 times more likely to AMI than type B

## Type B

- Rarely does a lot in a short time
- Feels comfortable with one idea or activity at a time
- Has patience, confidence, and security
- Participates in recreational or leisure sports activities
- Is responsible but if delayed is not affected

Meyer  
Friedman/Ray H.  
Roseman

# Bible character

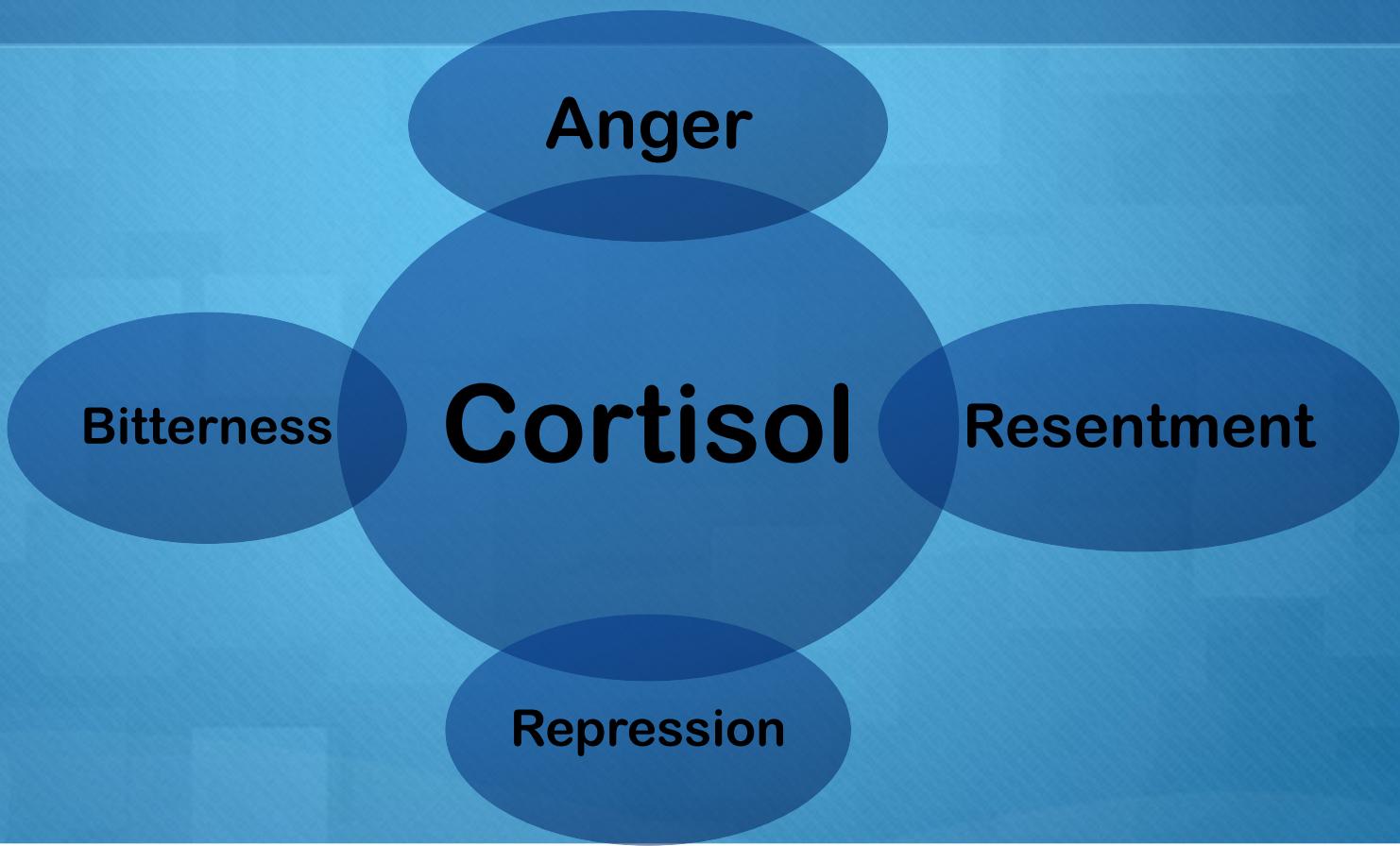
John

- Luke 9:54
- Matthew 20: 21

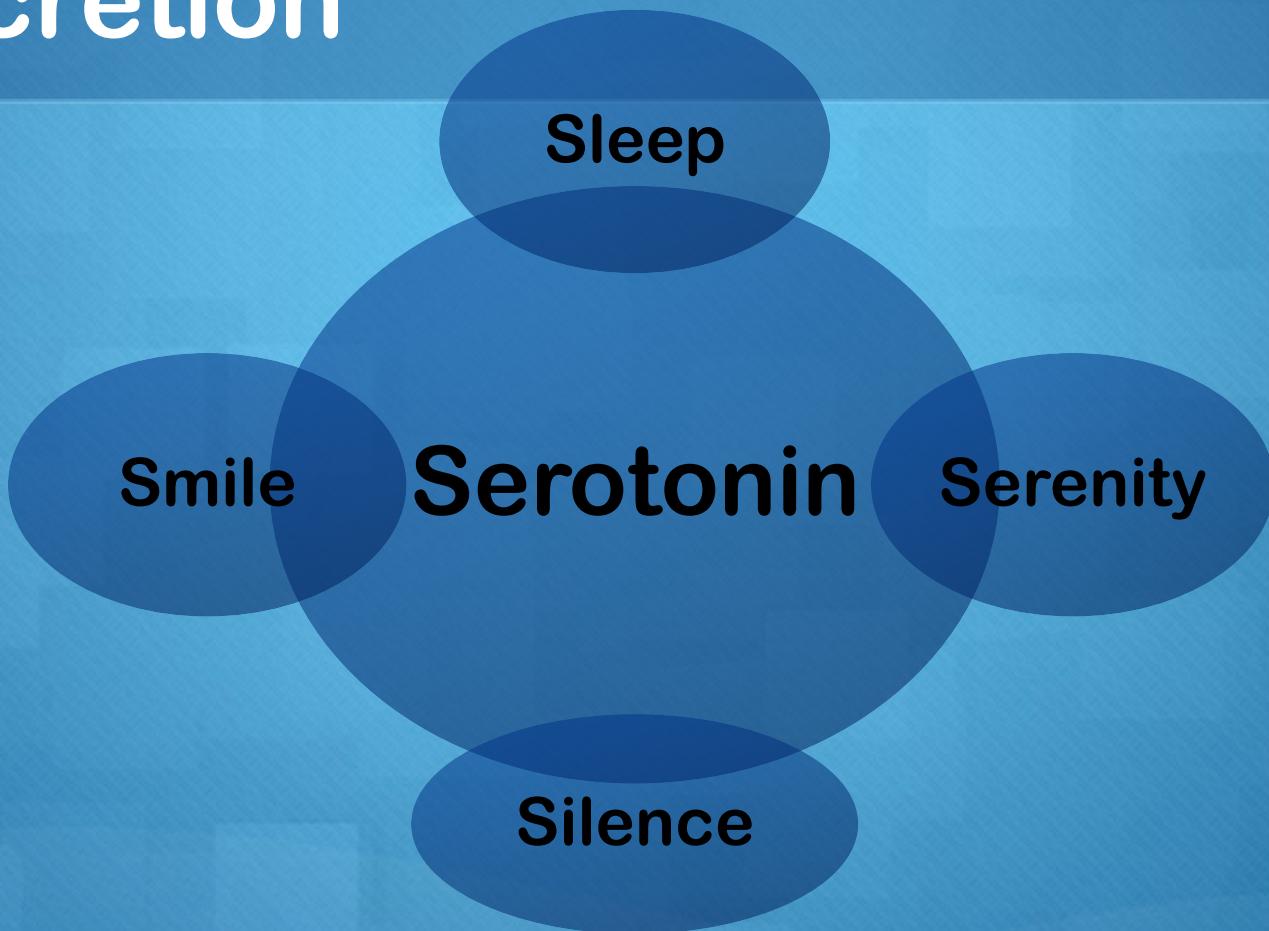
John

- 1 John 4:8

# R Behaviors / corrosive Cortisol



# S Behaviors/ serotonin secretion



# Serotonin Functions

- Inhibitory pain pathways in bone marrow
- Regulate the affective state.
- Stimulates intestinal motility.
- Associated to the genesis of sleep.

# Biblical support

- A cheerful heart is good medicine, but a crushed spirit dries up the bones. Proverbs 17:22

# Practical measures to reduce negative stress

- Do not work more than 10 hours a day
- Rest between tasks
- Sleep at least 7 – 8 hours a day
- Practice a creative hobby
- Exercise
- Avoid the use of drugs
- Reserve 1-2 days a week to rest
- Avoid competition in work and play
- Visit the doctor when necessary
- Discuss problems with someone you trust
- Love, friendship and affection
- Plan and organize your work
- Establish an order of priorities
- Do things without haste
- Focus on the present

# SDA Remedies

- Fresh air
- Rest
- Exercise
- Sunlight
- Water
- Nutrition
- Temperance
- Hope (trust in God)



# Biblical remedy

- Matthew 6: 25-34

# Bibliography

- Harrison, Internal Medicine 17th edition, vol. 2
- Guyton, Textbook of Medical Physiology 10th edition
- Holy Bible