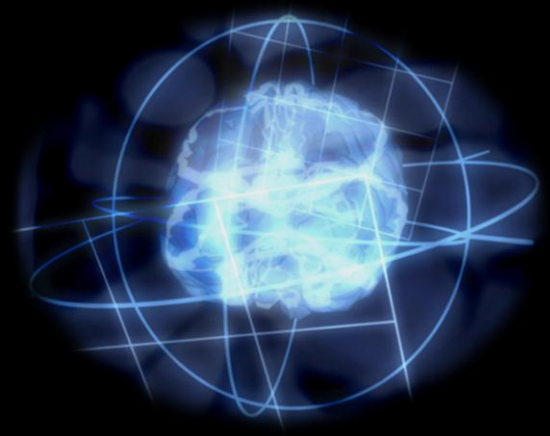
The Effects of Exercise on the Brain

EXERCISE
FOR STRESS
MANAGEMENT
FOR
BETTER HEALTH



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MODERN DEFINITION OF STRESS

Stress is experienced when a person perceives that demands exceed the personal and social resources that the individual is able to mobilize.

Exercise Management for Better Health

Stress dogs us like a bad tooth-ache:

There are at least 50 signs and symptoms of stress:

Frequent headaches, jaw clenching or pain; Gritting, grinding teeth; Stuttering or stammering; Tremors, trembling of lips, hands; Neck ache, back pain, muscle spasms; Light headedness, faintness, dizziness; Ringing, buzzing or "popping sounds; Frequent blushing, sweating; Cold or sweaty hands, feet; Dry mouth, problems swallowing; Frequent colds, infections, herpes sores; Rashes, itching, hives, "goose bumps“; Unexplained or frequent "allergy" attacks; Heartburn, stomach pain, nausea; Excess belching, flatulence; Constipation, diarrhea; Difficulty breathing, sighing; Sudden attacks of panic; Chest pain, palpitations; Frequent urination; Poor sexual desire or performance; Excess anxiety, worry, guilt, nervousness; Increased anger, frustration, hostility; Depression, frequent or wild mood swings; Increased or decreased appetite; Insomnia, nightmares, disturbing dreams; Difficulty concentrating, racing thoughts; Trouble learning new information; Forgetfulness, disorganization, confusion; Difficulty in making decisions Feeling overloaded or overwhelmed; Frequent crying spells or suicidal thoughts; Feelings of loneliness or worthlessness; Little interest in appearance, punctuality; Nervous habits, fidgeting, feet tapping; Increased frustration, irritability, edginess; Overreaction to petty annoyances; Increased number of minor accidents Obsessive or compulsive behavior; Reduced work efficiency or productivity; Lies or excuses to cover up poor work; Rapid or mumbled speech; Excessive defensiveness or suspiciousness; Problems in communication, sharing; Social withdrawal and isolation; Constant tiredness, weakness, fatigue; Frequent use of over-the-counter drugs; Weight gain or loss without diet; Increased smoking, alcohol or drug use; Excessive gambling or impulse buying

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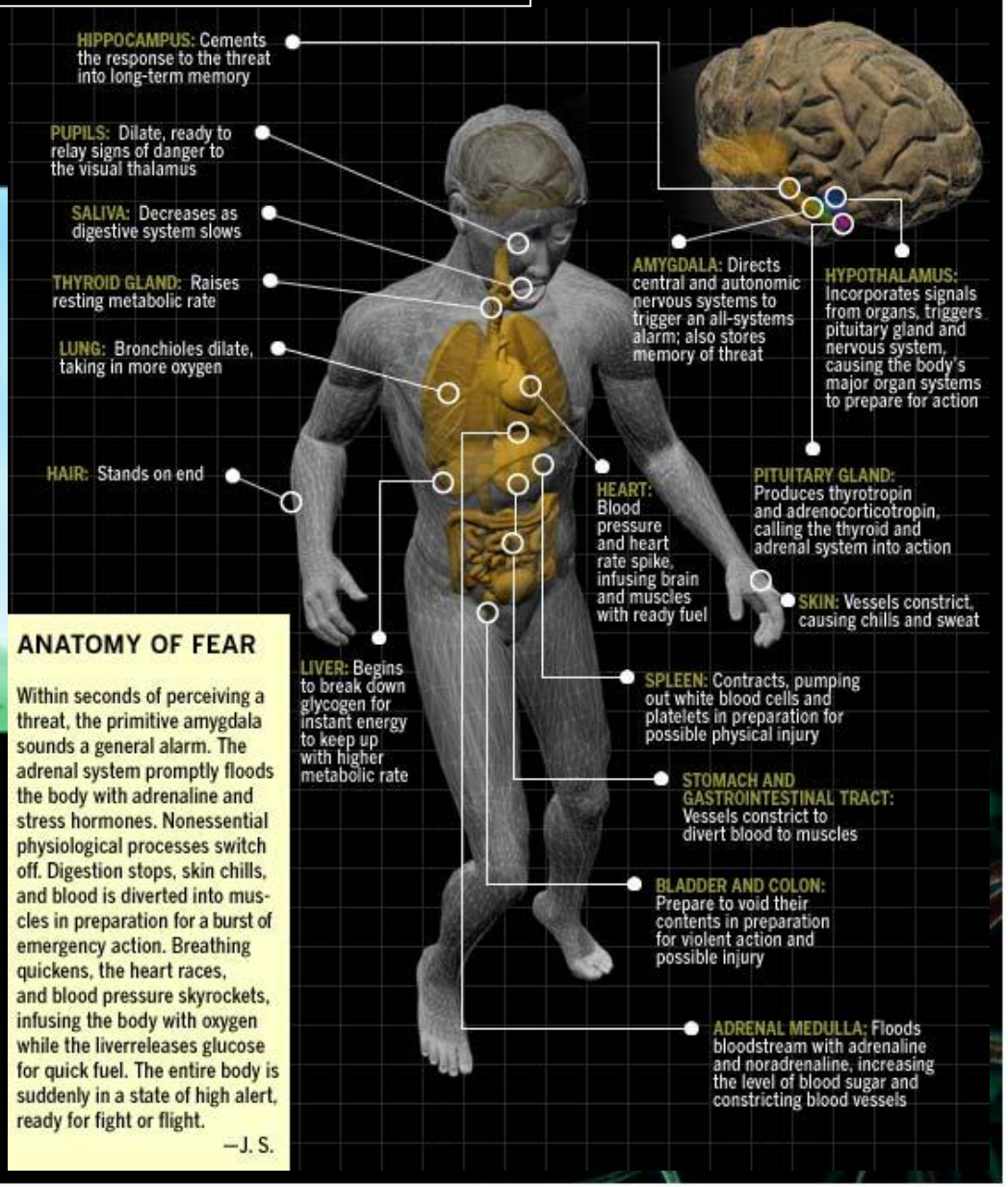
- **What we know**:

SHORT TERM



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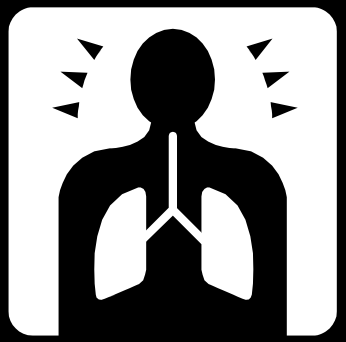

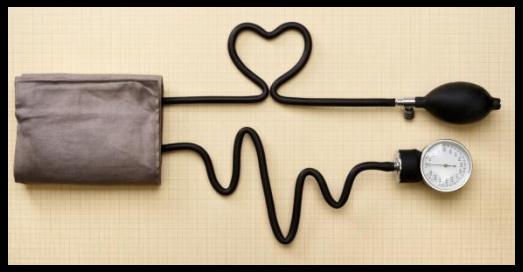

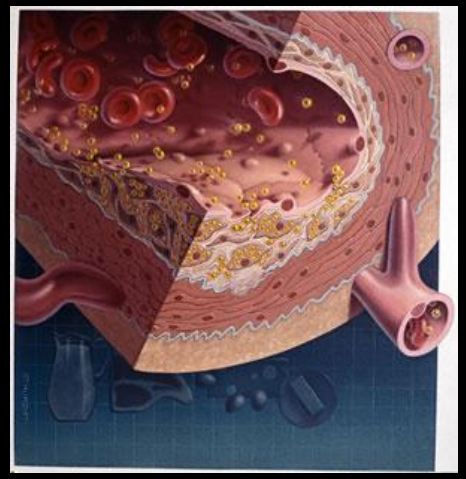

What we know:

1. Increased heart rate
2. Increasing breathing rate
3. Increased blood pressure
4. Increased production of sugars, triglycerides, cholesterol
5. Blood diverted away from skin and extremities

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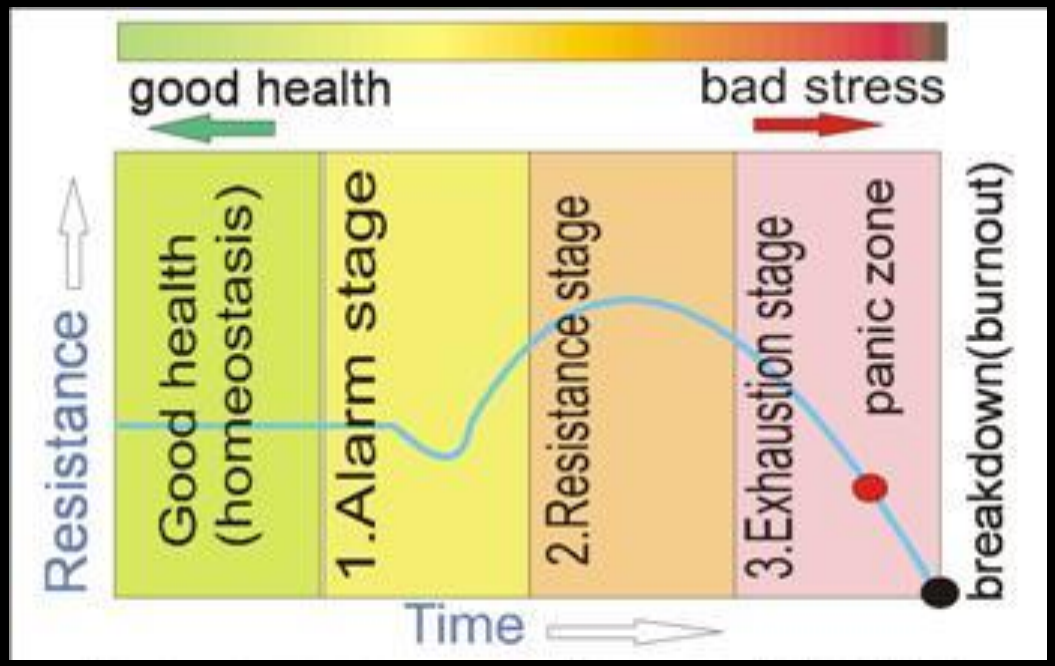
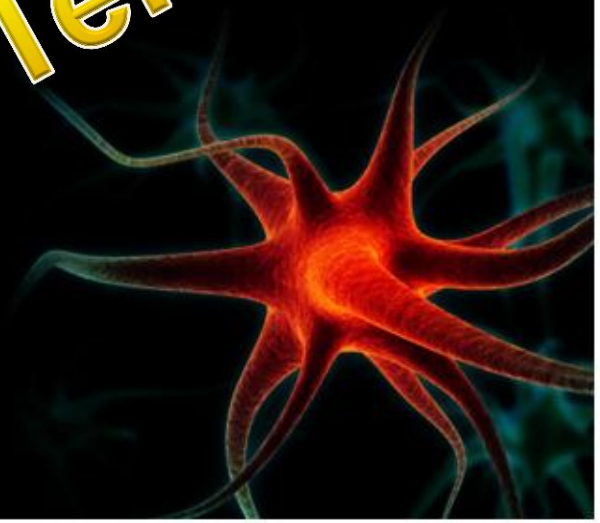


GAS

General Adaptation Syndrome

Long-Term



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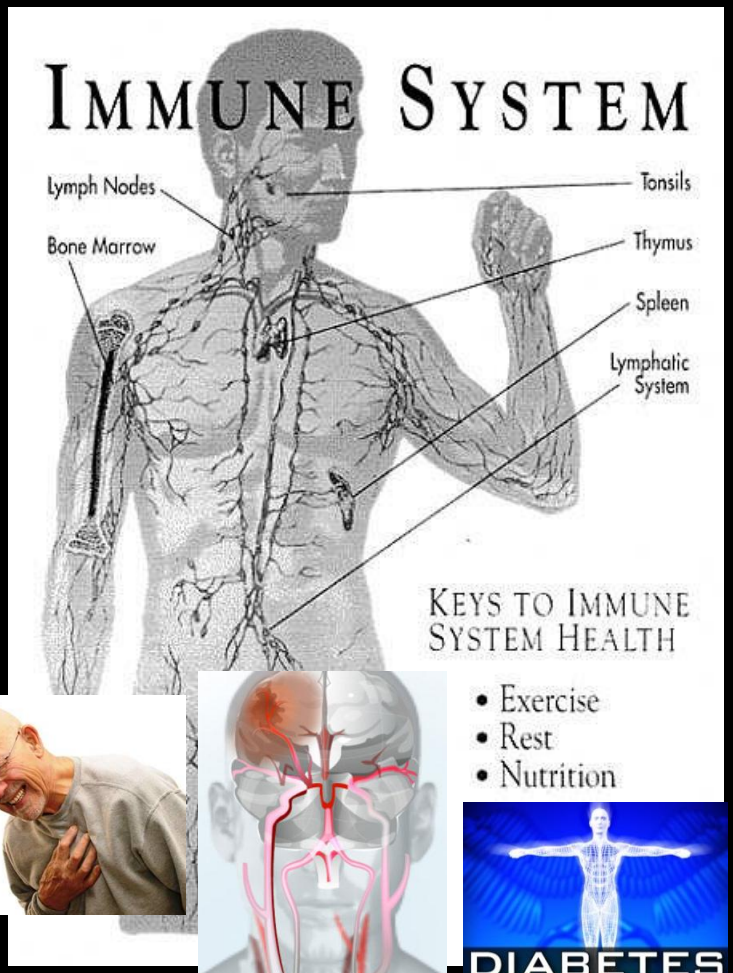
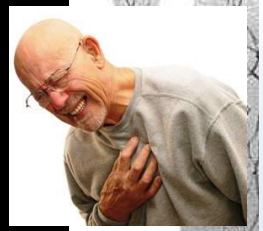


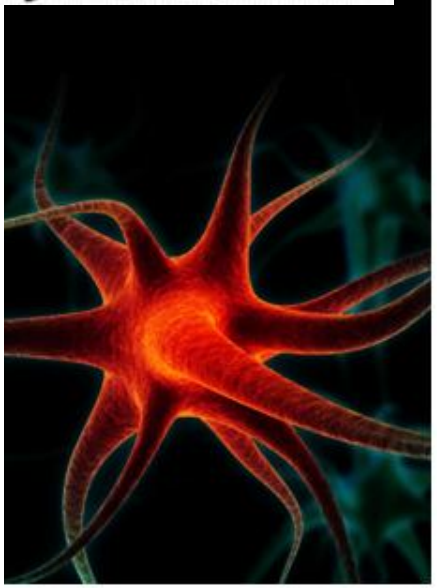


1. **Corticotrophin Releasing Factor: appetite suppressor!**
2. **Opportunistic diseases: heart disease, hypertension, diabetes**
3. **Sick more frequently**

Long-Term Effects of Stress

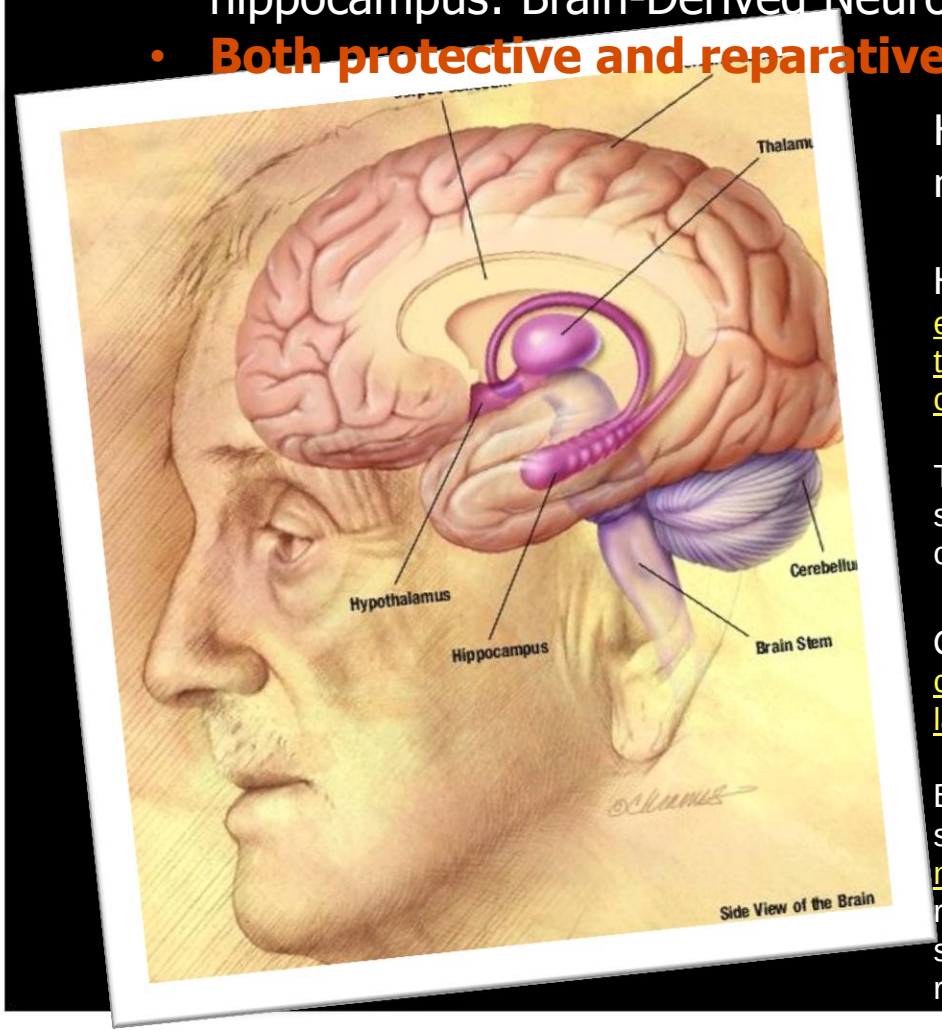
Exercise Management for Better Health

EXERCISE



Exercise Management for Better Health

- **What we know**:
  - Exercise causes creation of new neurons in the hippocampus: Brain-Derived Neurotrophic Factor (BDNF)
  - **Both protective and reparative**



Hippocampus: short and long term memory and spatial navigation

Hypothalamus: link the nervous system to the endocrine system via the pituitary gland; controls body temperature, hunger, thirst, fatigue, sleep, and circadian cycles

Thalamus: relaying sensation, spatial sense, and motor signals to the cerebral cortex, along with the regulation of consciousness, sleep, and alertness

Cerebellum: brain that plays an important role in motor control, cognitive functions such as attention and language, and in regulating fear and pleasure responses

Brain Stem: brain stem provides the main motor and sensory innervation to the face and neck via the cranial nerves. The brain stem also regulates cardiac and respiratory function. It also regulates the central nervous system, and is pivotal in maintaining consciousness and regulating the sleep cycle.

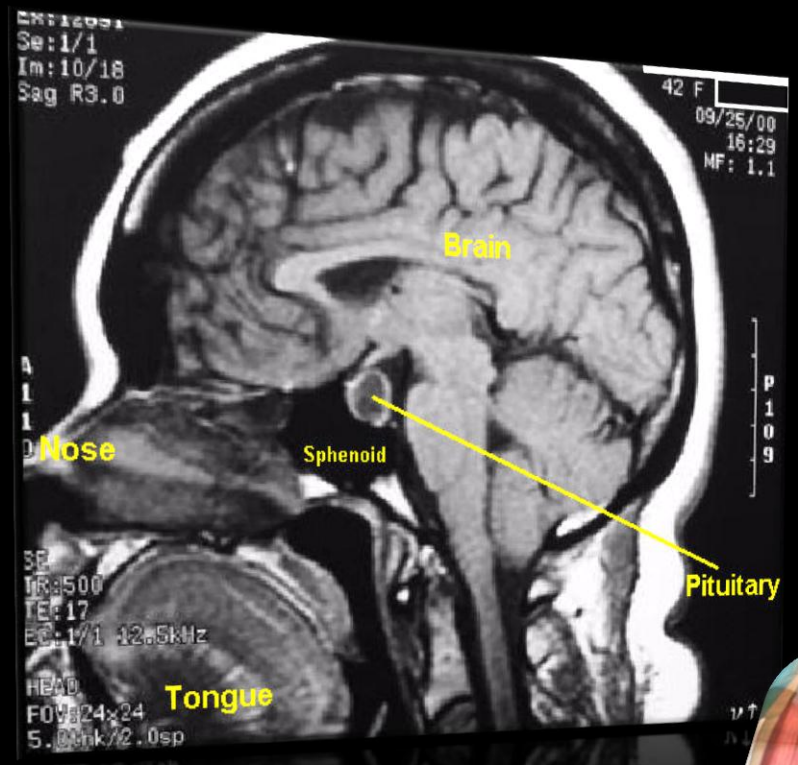
Exercise Management for Better Health

- **What we know**:
  - Humans start to lose nerve tissue at age 30
  - BDNF: reinforces neural connections by increasing the number of connections and increases the number of cells: allows us better storage and processing of information

  - Physically active people recover from mild depression faster
  - Depression is related to low-levels of serotonin and norepinephrine: **EXERCISE** increases these neuro-transmitters!

Exercise Management for Better Health

- **What we know:**



Pituitary Gland: The pituitary gland secretes nine hormones that regulate homeostasis.

Endorphins: neurotransmitters are produced by the pituitary gland and the hypothalamus in vertebrates during exercise, excitement, pain, and they resemble the opiates in their abilities to produce a feeling of well-being.

Blood levels of endorphins have been found to increase as much as 5-fold the resting rate after a prolonged bout of physical exercise: (30 mins+)

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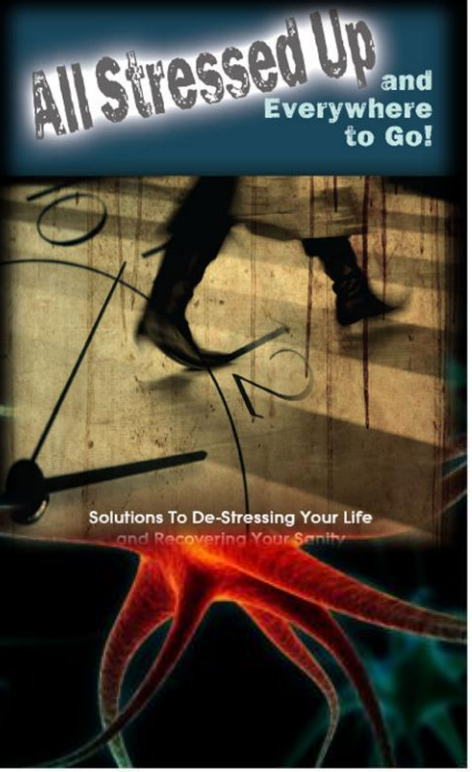
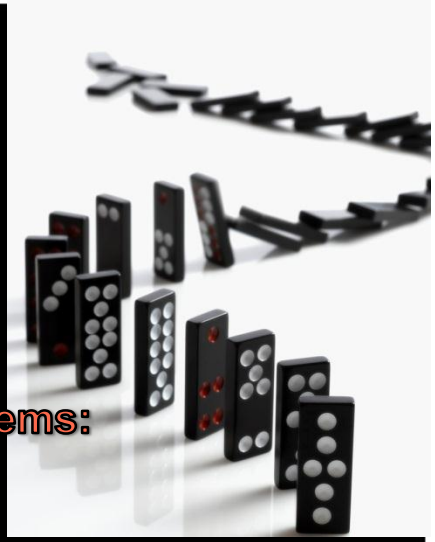
What we all need to do:

1. Exercise at least every other day
2. Exercise vigorously for those endorphins
3. Need to eat healthy
4. Practice stress management techniques
5. Need to recognize symptoms when under stress
6. Need to have a plan and execute the plan when under stress!



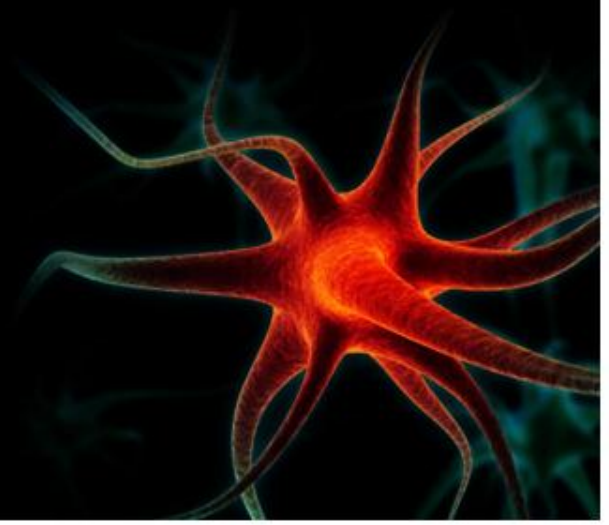


Nutrition

1. Once the immune system is harmed, it's a domino effect of problems:

2. Body's nutrients are depleted much faster than normal.

3. Unhealthy "quick fixes"
   - Good eating habits go out the window
   - Poor food choices exacerbate the stress response
     - refined sugar; processed flour; salt, caffeine-these foods trigger the release of epinephrine/norehinephrine which increases heart rate, blood pressure, and metabolic activity.



Nutrition: what can we do?

1. Eat a variety of food colors
2. Choose foods that are high antioxidants
3. Choose organic if possible
4. Drink filtered water
5. Reduce caffeine consumption
6. Avoid modified foods
7. Fresh herbs and spices
8. Free range meats
9. Enough fiber
10. Omega-3 oils
11. Steam your veggies
12. Choose supplements wisely

Thank You