

THE IMPACT OF
STRESS ON
HEALTH
CONDITIONS



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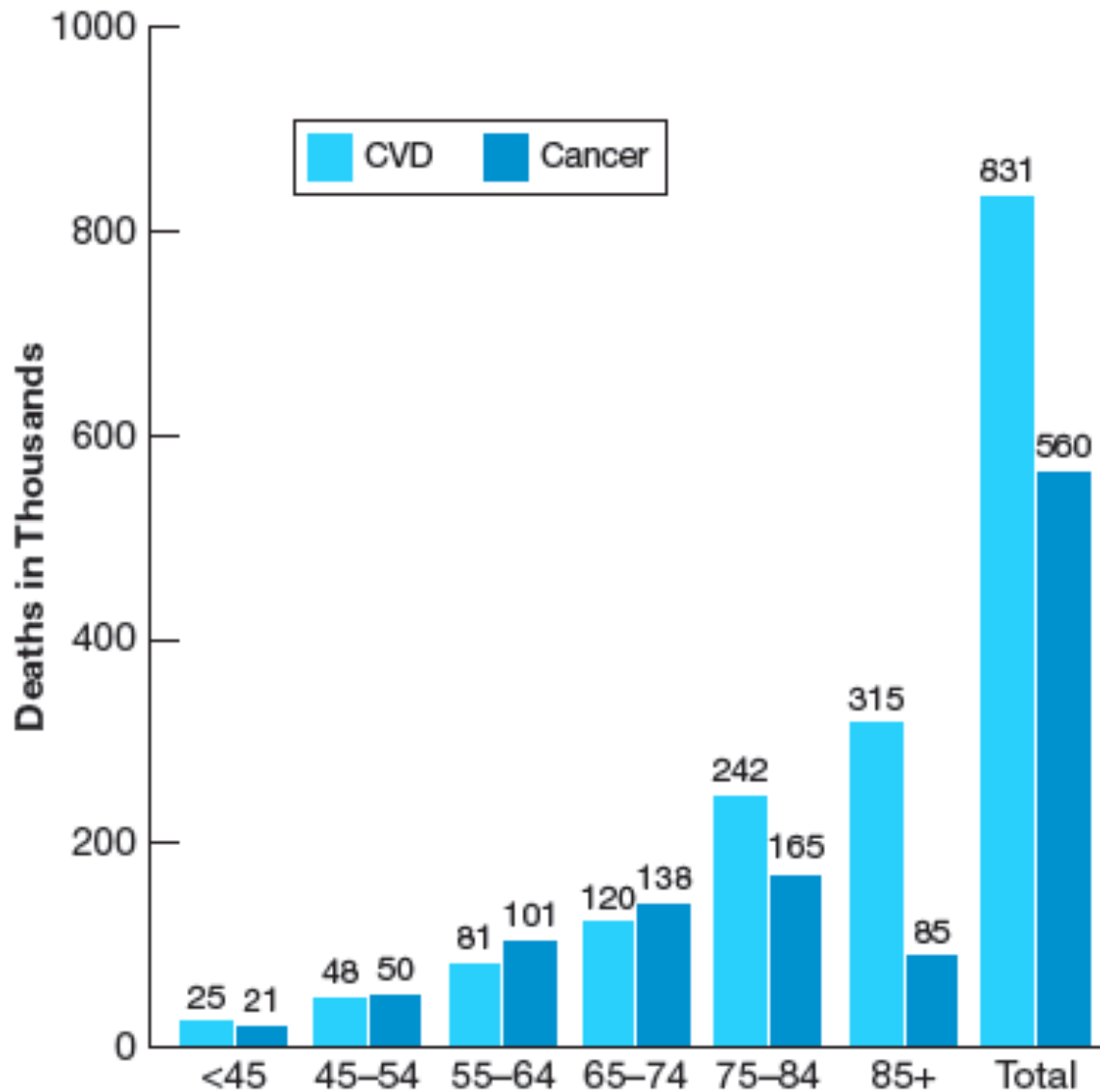
Discussion Topics

1. The Strong Evidence
2. The Mixed Evidence
3. The Weak Evidence

THE STRONG EVIDENCE

Cardiovascular Disease

- For the health conditions in this section, there is strong evidence indicating that stress plays a part
- **Coronary heart disease (CHD):** a progressive degenerative inflammatory disease that involves coronary atherosclerosis; leading cause of death for men and women in the US
 - Irritation or injury stimulates the **inflammatory response** of the endothelial cells of the vascular wall



Cardiovascular Disease Deaths vs. Cancer Deaths by Age in the United States in 2006.

As can be seen, the death rates from cardiovascular disease begin to far surpass those from cancer beginning around age 75.

SOURCE: American Heart Association (2010). *Heart disease and stroke statistics-2010 update*. Dallas, Texas: American Heart Association.

A microscopic view of numerous red blood cells, appearing as bright red, biconcave discs against a dark background. The cells are scattered across the frame, with some in sharp focus and others blurred in the foreground and background.

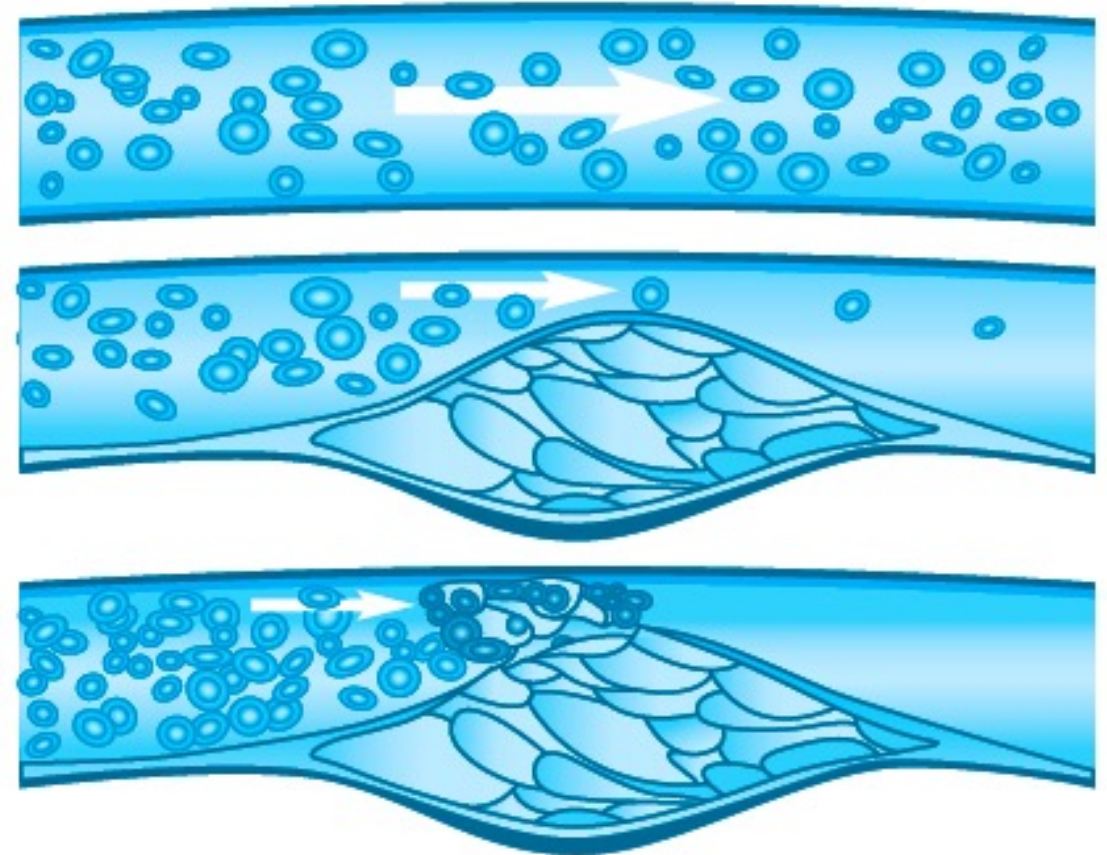
Cardiovascular Disease

- Sources of injury can be
 - stress reactions
 - high blood pressure
 - chronically high blood sugar levels
 - bacterial infection of the arteries
 - and more
- White blood cells (leukocytes) react to the injury/irritation
- Leukocytes called monocytes eat LDL (bad cholesterol) and turn into macrophages that develop into a plaque that lines the vascular wall
- The coronary artery becomes enlarged and weakened

Cardiovascular Disease (cont'd.)

- A cardiac event can occur when the plaque ruptures and a blood clot forms to stop the bleeding

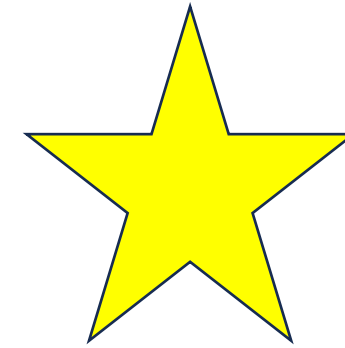
- **Figure:** An atherosclerotic plaque forms inside the vascular wall of the coronary artery, a type of intra-arterial pimple that consists of cholesterol-laden foam cells, smooth muscle cells, and other debris.
- The coronary artery has essentially been remodeled by the plaque causing the bulge in the arterial wall and partial occlusion of blood flow to the heart.



Cardiovascular Disease (cont'd.)

- There is a connection between acute and chronic stress and elevated blood pressure
- Essential hypertension (**HTN**) (or high blood pressure) is linked to congestive heart failure, stroke, and more
- Stress management appears to reduce cholesterol levels, but the relationship is complicated

Cardiovascular Disease (cont'd.)



SCD

Sudden cardiac death (SCD) can occur as a result of high level of stress or intense emotional reaction

Negative

Negative emotions and depression are associated with cardiovascular disease (CVD) and events more than positive ones

Low DL

Low decision latitude: psychological stress caused by having a low degree of control is a predictor of CVD (i.e., low control over job)

- CVD Prevention strategies:
 - Do not smoke
 - Eat fruits and vegetables
 - Exercise more
 - Lower cholesterol
 - Control obesity
 - Prevent diabetes
 - Manage stress
 - Prevent high blood pressure
 - Use good judgment with alcohol use

Skeletal Muscle Conditions

- Tension of the skeletal muscles can be caused by stress
- Tension-type headache (TTH) most common type of headache
 - TTH sufferers report a higher number of daily hassles (proximal stress)
 - TTH patients more likely to be pain sensitive
 - Initial onset of migraine headache is related to **distal** rather than **proximal** stress

Skeletal Muscle Conditions (cont'd.)

- Bruxism (**teeth grinding**) and temporo-mandibular pain and dysfunction syndrome (TMPDS) seem to be stress-related
 - Patients with these disorders have high muscle tension

Skeletal Muscle Conditions (cont'd.)

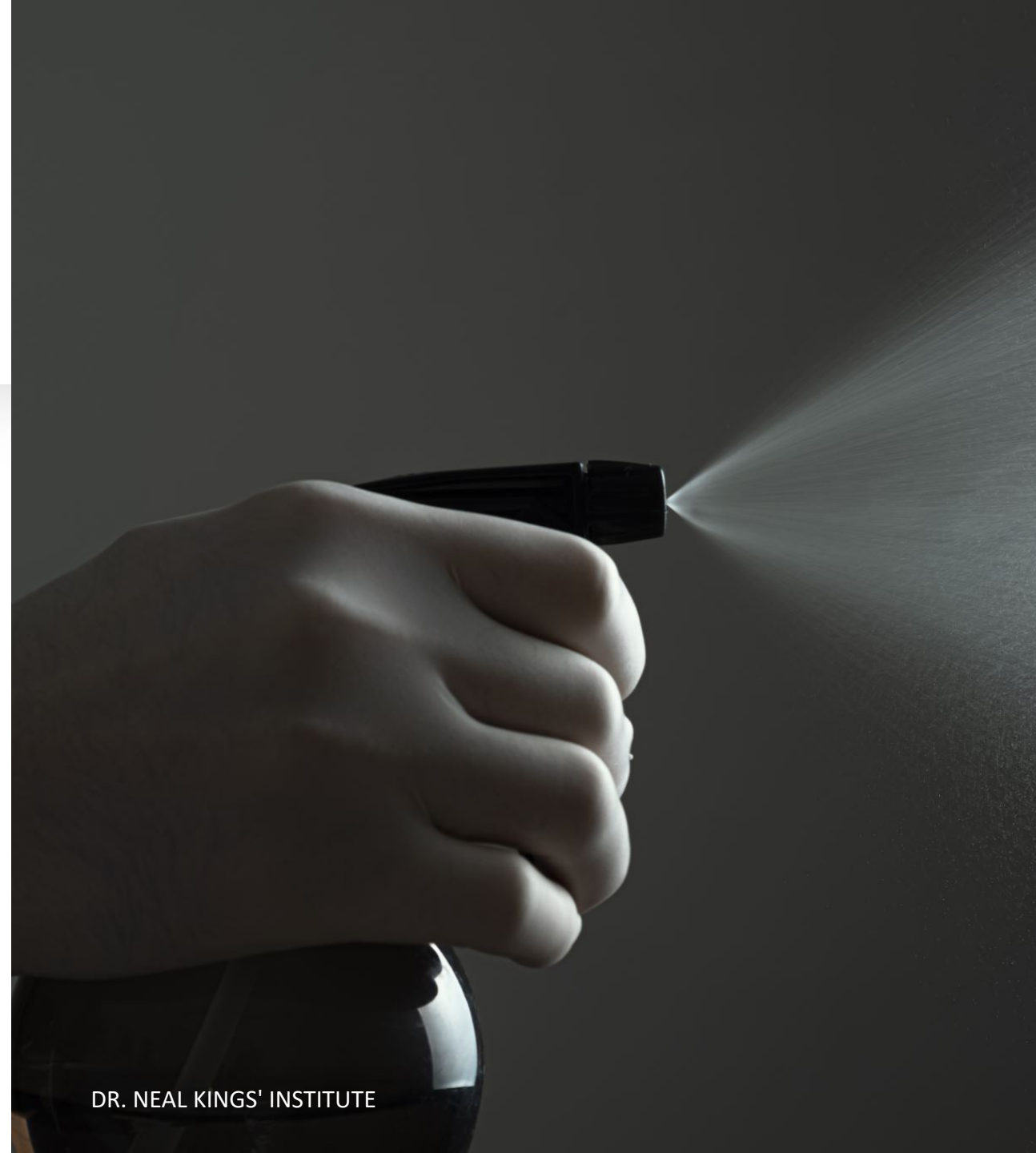
- Prevention strategies for skeletal muscle conditions:
 - Acute behavioral treatment for specific episodes of TTH
 - Biofeedback combined with relaxation
 - Cognitive-behavioral stress management
 - Night guard for TMPDS

Atopic Disorders – Asthma, Allergic Rhinitis, and Atopic Dermatitis

- **Atopic disorders:** mucosal inflammatory disorders caused by biological hypersensitivity and inflammation
- Asthma can be caused by allergens, exertion, and even early psychosocial factors
 - Asthma attacks create stress, which in turn create more asthma attacks
 - Asthma sufferers should avoid certain triggers (cigarette smoke, animals, pollen, etc.)
 - Writing about stressful experiences can also help

Atopic Disorders

- Allergic rhinitis sufferers experience cold-like symptoms in response to airborne pollen, particles, or chemicals
 - Linked to early stress exposure
- **Atopic dermatitis** is hypersensitivity of the skin to food or environmental allergens
 - Antihistamines and washing clothes to get rid of allergens can help people with atopic disorders



THE MIXED EVIDENCE



EVIDENCE FOR AND AGAINST



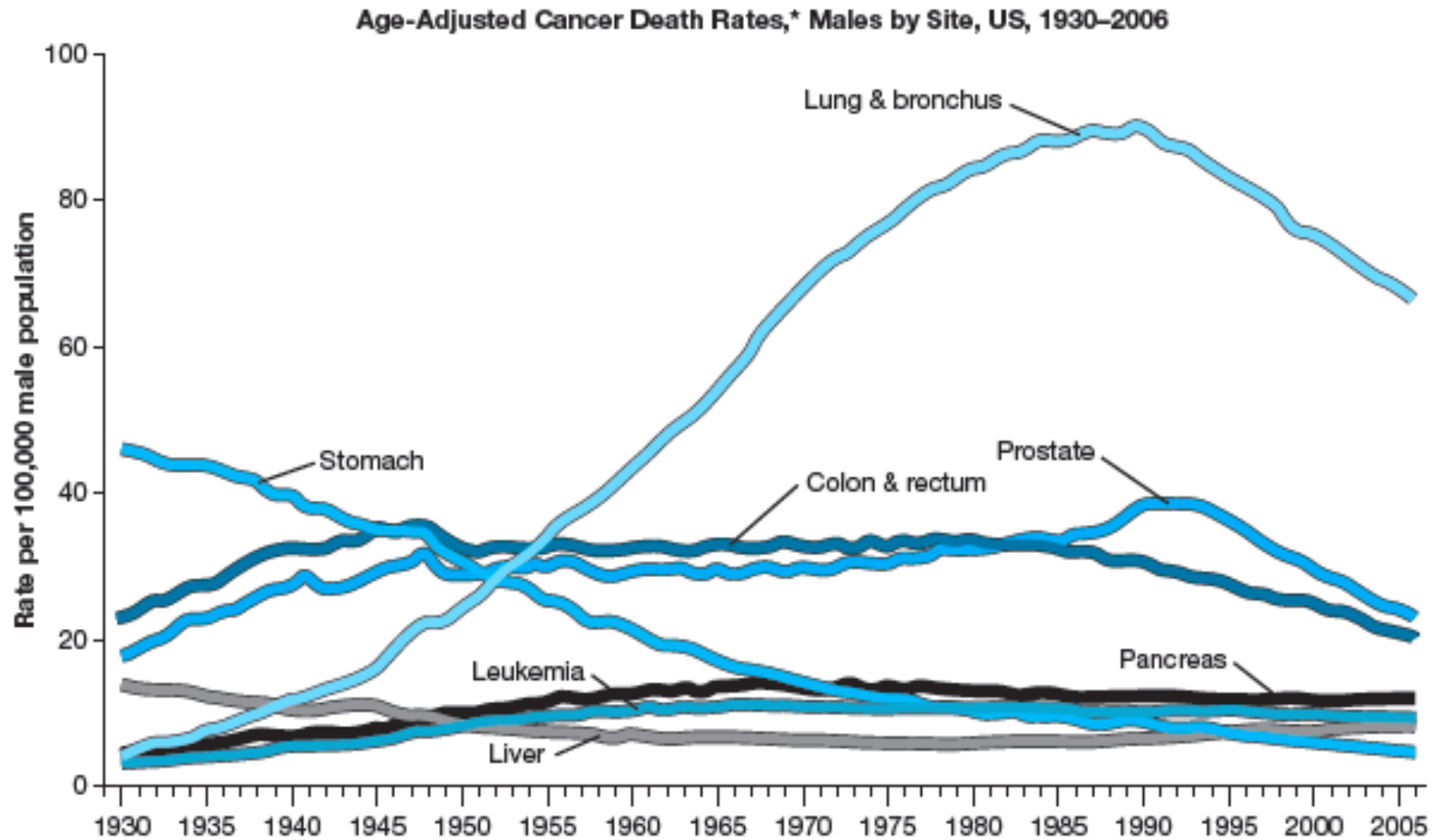
UNCLEAR FINDINGS

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Cancer

- **Cancer:** endogenous abnormal cells develop, proliferate, and invade the body's healthy tissues
 - In a study of German women born before WWII, there was a link between experience of stressors and cancer
 - Possible mechanism is immunosuppression of NK cells
 - Research in mice has shown a link
 - However, overall empirical evidence is mixed





*Per 100,000 age adjusted to the 2000 US standard population.

Figure: Though declining, lung cancer continues to be the leading cause of cancer death among men, followed by prostate and colon cancer. SOURCE: American Cancer Society (2010)

Cancer (cont'd.)

- Prevention strategies:
 - Cancer screening
 - Avoiding tobacco
 - Protection from the sun
 - Eating healthy foods
 - Losing weight
 - Psychological interventions can promote longevity in cancer patients

THE WEAK EVIDENCE



Gastrointestinal System Conditions

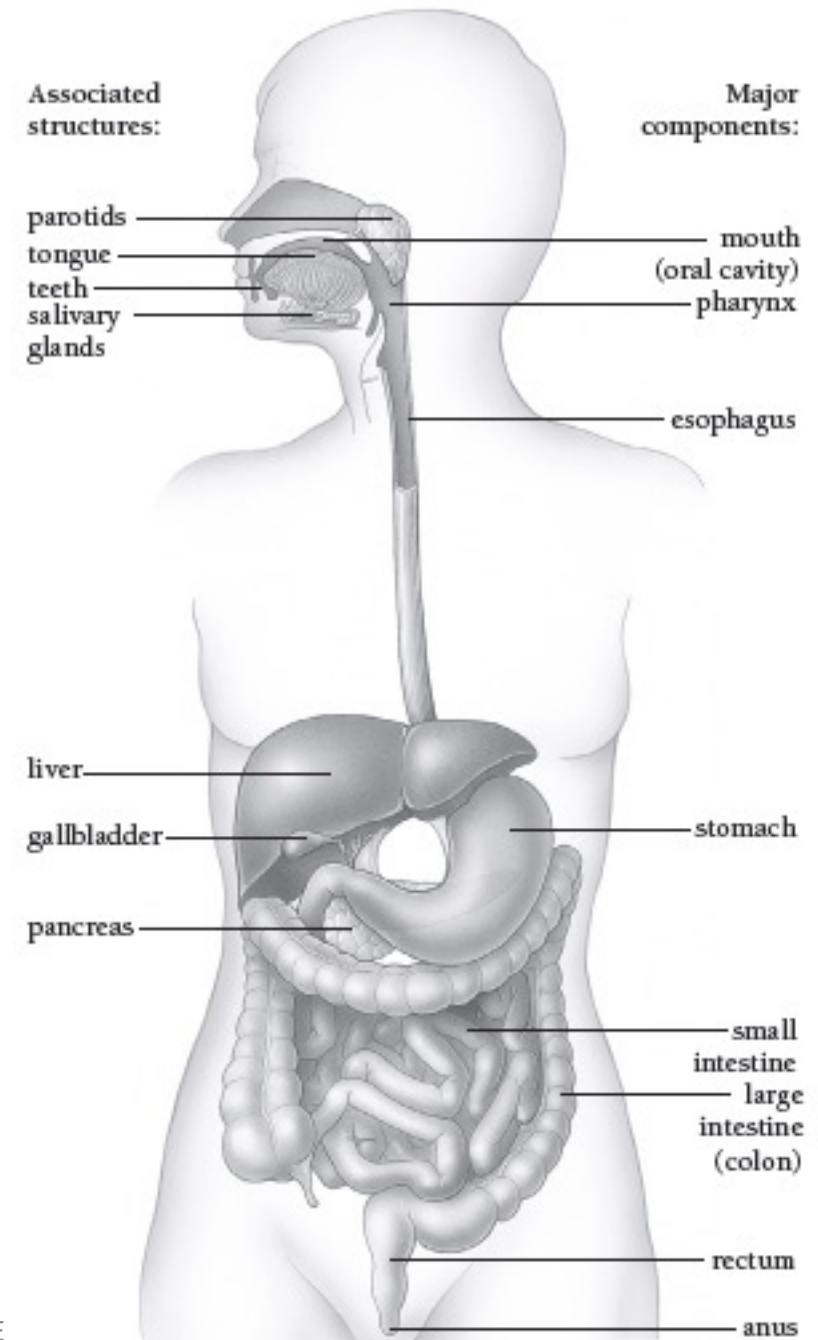
- Gastrointestinal (GI) system is designed to ingest and digest food

Figure: Upper and lower GI tract and accessory organs.

The upper GI tract involves the mouth, pharynx, esophagus, and stomach

The lower GI tract consists of the small intestine and the large intestine, of which a section of the latter includes the colon.

Accessory organs are organs that aid in digestion and include the liver, gallbladder, and pancreas.



Gastrointestinal System Conditions (cont'd.)

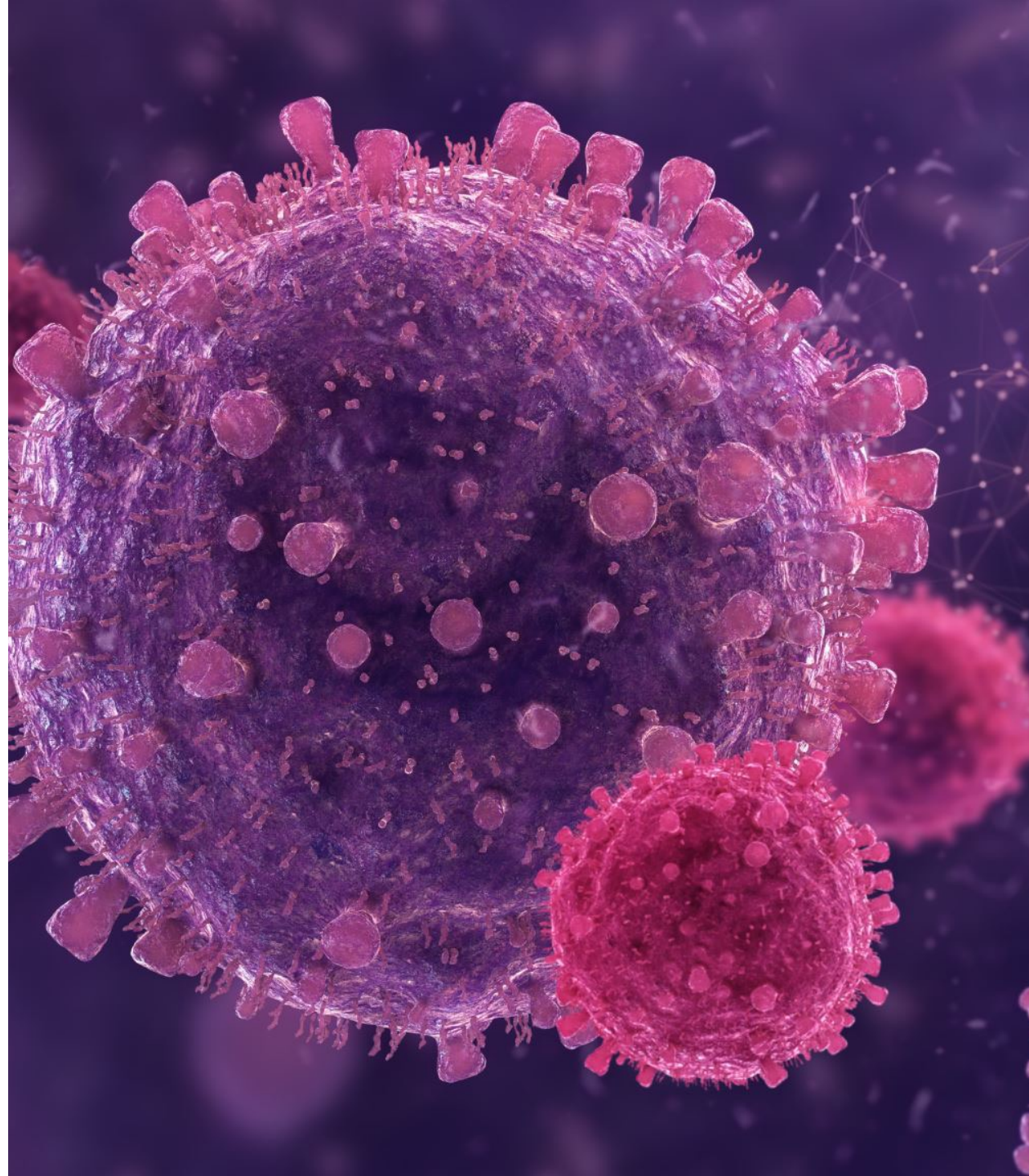
- Peptic ulcers once thought to be the result of stress, but now the focus is on bacteria as the cause
- Irritable bowel syndrome (IBS) characterized by abdominal pain or tenderness and constipation or diarrhea
- Daily hassles may exacerbate symptoms, leading to more stress
- In general, stress is not shown to be a contributive factor

Gastrointestinal System Conditions (cont'd.)

- Coping strategies:
 - Peptic ulcers can be cured with antibiotics
 - IBS more difficult to treat, but systems can be managed, sometimes in tandem with medication

Systemic Autoimmune Disorders

- **Systemic autoimmune disorders:** the body's immune system attacks its own cells and tissues
- Immune system fails to recognize itself from outside intruders



Systemic Autoimmune Disorders (cont'd.)

- Systemic lupus erythematosus (SLE) symptoms range widely but include fatigue, fever, rash, weight loss, and secondary psychological issues
 - Daily stress has higher impact than life stress on exacerbation of SLE symptoms
 - Stress seems to impact quality of life of SLE patients more than that of non-SLE controls
 - Medication often used to control SLE, and lifestyle changes can decrease symptoms



Systemic Autoimmune Disorders (cont'd.)

- Rheumatoid arthritis is a chronic autoimmune disorder characterized by inflammation and possible damage of joints and surrounding tissues
 - Negative life-change stress, having a more active form of RA, and little social support lead to exacerbated stress impact of daily stressors on RA pain

Systemic Autoimmune Disorders (cont'd.)

- Acute stress does lead to circulating inflammatory agents
- Can be associated with flare-ups of RA
- Coping strategies for RA include medications, behavioral approaches, and CBT

Summary

- Stress plays a causal role in some conditions; just exacerbates others
- Stress known to cause hypertension
- Sudden cardiac death often occurs after a stressor
- Evidence suggests that TTH related to proximal stressors and migraine to distal stressors
- Stress linked to bruxism and TMPDS

Summary (cont'd.)

- Early stress exposure, low social support, and psychological stress may be a cause for later atopic disorders
- More evidence for stress and cancer progression than stress and cancer onset
- IBS may be exacerbated by daily stressors
- Stress not shown to be a cause of autoimmune diseases
- Daily stressors may exacerbate SLE and RA