What are the Bodily Effects of Long-Term Stress?

- Health shows often seem to copp up under stress... 
  - High blood pressure 
  - Stress can cause mental health disorders 
  - Stress can cause physical health disorders 
  - Stress can cause chronic health problems

Why do some people get sick & others don’t?

- Diathesis-Stress Model
  - Diathesis-Stress: Diathesis means “vulnerability”
    - vulnerable to stress-related disease because of genetic weakness or biochemical imbalance predisposing them to disease
    - predisposed to react in place in “right” environment
      - (1) permanent disposition  (2) experience stress
  - perfectionist women
    - react more, depressed, bulimic (if thought self overweight)
  - explains variability in SRRS
By What Pathways May Stress Cause/Effect Disease?

- **Direct Effects**
  - Nervous System
  - Endocrine System
  - Immune System

- **Indirect Effects**
  - Health behaviors
    - Stress often accompanied by poorer health behaviors
      - smoking
      - drinking
      - eating (too much or too little)
      - sleep problems etc.

Stress-Headache Relationships

- **Headaches-**
  - Over 100 kinds
  - Stress related to 2 in particular Tension & Migraine
  - More related to “daily hassles” than “life events”

- **Tension-** increased muscle tension in head & neck

- **Migraine-** vascular “pulsation”- 
  - Expansion and contraction of arteries in the head.

Stress-CVD: Precipitator of Cardiovascular Events

- **CVD-** all forms of heart and vascular disease
  - Heart Attacks- (usually study already diseased population)
    - Greater 6 months LE stress
    - Bereavement, Loss of Prestige, & loss of employment
    - Negative emotion trigger attacks (sadness, anger, not reported in book, but happiness decreased risk)
  - Stroke-
Stress-CVD: Stress as a developmental agent

Stress-Hypertension relationship difficult to define at this point

- Hypertension: 140 SBP and/or 90 DBP
  - major predictor of CHD and CVD
- Stress can cause temporary hypertension
  - usually when stress is removed BP falls suggested that no consistent change has occurred
  - Long-term relationship with sodium suggest one pathway by which stress leads to hypertension.
    - Stress leads to retaining of sodium, elevates BP

Stress-CVD: Reactivity and Final Thought

- Reactivity- CV response to stressor
  - fairly stable response pattern in people
  - shown to affect CHD development particularly in high risk people
  - relationship with hostility, gender, & ethnicity
- Stress appears to act in a causal way for those under severe psychological stress. Mixed results elsewhere.

Stress & CVD: Indirect Avenues & Other Thoughts

- Risky Behaviors--
  - stress leads to poor health habits & behaviors
    - smoke, violence, drink, drug use (last 2 males)
    - eating behavior (women)
- Job Strain (Demand/Control at work)
  - a “synergistic relationship” with social network strength.
- Social Support increasingly important in understanding relationship between Stress and CVD
Stress-Illness: Diabetes, Asthma, R.Arthritis

- Diabetes- IDDM (behavioral) IDDM (childhood)
  - effects of stress appears largely indirect - that is affects management and onset of condition, but not cause of condition.
  - Stress--> compliance issues
- Asthma- emotional event shown to trigger attacks
- Rheumatoid Arthritis- inflammation of joints (immune system response)
  - secondary effects
  - related to pain sensitivity, inflammation levels
  - maybe link to neuroendocrine system.

Stress-Immunity Relationships

- PNI: Psychoneuroimmunology
- infectious disease (common cold viruses): Are people under stress more likely to develop infectious disease?
  - appears moderated most strongly by recent life events or daily hassles
  - Duration of stress appears particularly important as well
- Cohen et al.: Predictors of Cold Symptoms
  - number of major life events in past year
  - perception that demand exceeds coping resources
  - current level of negative affect (15 emotional states)
- Conclusion: Degree of psychological stress was related in a dose-response fashion to respiratory infection and common cold contraction.
  - For all 3 forms of stress

Percent of Subjects with Colds as a Function of an Index of Psychological Stress

Disclosing Trauma and Illness

Before Study | After Study
---|---
Trauma | Control

Note: Data from Pennebaker et al. (1988).

Disclosing Trauma and Immunity

Before | After
---|---
Control | Low Disclosure | High Disclosure

Note: Data from Pennebaker et al. (1988)
The Immune System

- Where and What: Tissues, Organs and biochemical process/agent that protect from bacteria, fungi, viruses (antigens)
- Role: (1) Recognize Foreign Objects (2) Kill Them (3) Call off Response when threat is Disabled (4) Be prepared for future “invasions”
- “The Players of the Immune System”
  - Skin & Mucous
  - Lymphocytes (WBC) originate in bone marrow move in lymphatic system
    - T-cells, B-cells, NKC cells
    - Granulocytes (chemical) & Macrophages (pac-man)

Functions of Immune System

- Mechanical Barriers- 1st line of defense
  - skin & mucous
- Non-specific Response to invading antigen
  - Phagocytosis
    - granulocytes
    - Macrophages
  - Inflammation- increase of blood and warmth attract immune system “warriors” to site of injury/problem (fig 6.2)
- Specific Response- “cell mediated immunity”
  - T & B-cells (develop “memory”) we call “immunity”
  - Antibodies- “search & destroy”
How May Stress Affect Immunity?

- Chronic Stress & Cortisol Release
  - Anti-inflammatory and Antiphagocytotic
- Cytokines-Brain-Nervous System
  - Circular relationship
- Stress-Health Behaviors (Baum & Poslusny, 1999)

Immune Deficiencies & Disorder

- Immunity- protected from antigents
  - vaccinations- weakend form of a virus introduced to body allowing cellular “memory” to be safely created.
    - Very good for viral infections
- Immune Deficiency- inadequate immune response
  - “bubble boy”
  - HIV/AIDS- destroys T-cells and macrophages
    - HIV- highest concentration in blood & semen
  - Allergies- abnormal reaction to antigen
  - Autoimmune Diseases
    - Lupus & rheumatoid arthritis
  - Transplant rejection