

Physical and Emotional Effects of Stress

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What Is Stress?

State Response to internal or external events.



- Every system of the body responds to stress in varying ways that influence how people **feel** and **behave**.
- Stress brings **mental** and **physical** disturbance in living things and may manifest as symptoms in one or both of these domains.

Not All Stress Is Bad

Motivating & Exciting

- Job change
- Promotion
- Life transitioning events
(i.e., marriage, graduation, baby)
- Travel
- Continuing education
- Competitive or extreme sports



Common Stressors

Individual Factors



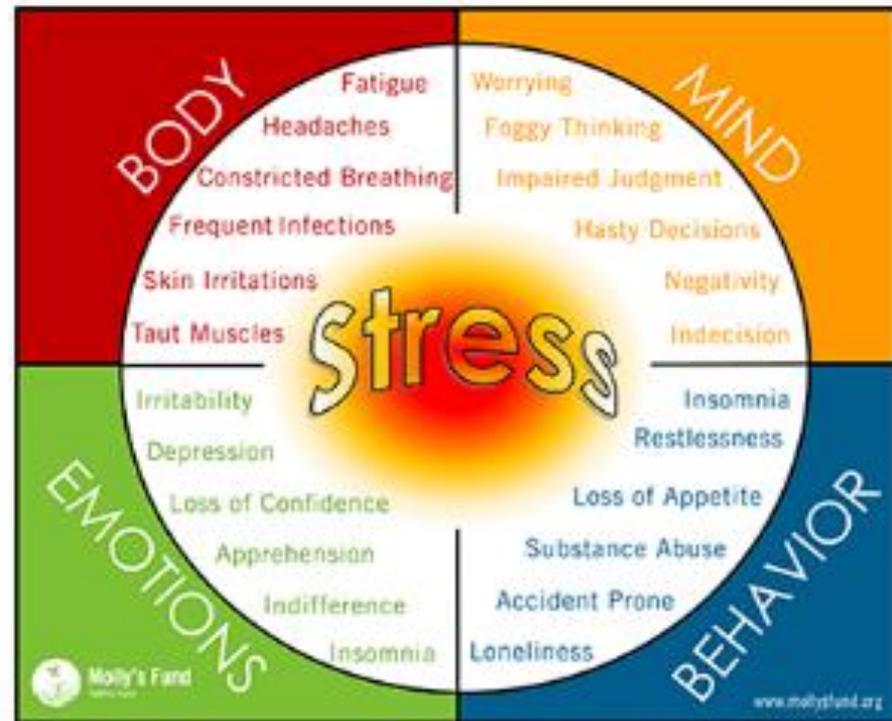
- Employees often **feel trapped** by salary, limited job opportunities, inability to relocate, highly specific or outdated skill sets, & barriers to accessing training & education.
- Personal & **relationship problems**.
- **Family** & child concerns.
- Finances & **debt**.
- **Illness**, death.

Work Stressors

- Projects ending
- Exempt employees losing professional identity/autonomy
- **Layoffs, downsizing**
- Pressure to work smarter, increase efficiency
- Difficulty completing projects, meeting deadlines
- **Changing policies, protocols**
- **Funding, budget**
- Limitations in science, application of new research
- Contract changes
- **Safety concerns, job hazards**
- Benefit changes, health insurance costs
- **Aging, retiring workforce**
- Shifts in culture, norms

Combined, Excessive, or Prolonged Stress

- Negative emotions
- Poor coping behaviors
- Physical health problems
- Diminished cognitive functioning



Negative Emotions

- Loss of motivation
- Loss of joy
- Loss of meaning
- Moody
- Irritable
- Negative attitude
- Resentment
- Sadness
- Hopelessness
- Anger
- Anxiety
- Depression



Financial Impact of Negative Attitude



- **ATTITUDE**
directly influences
productivity, morale, & turnover rates.
- The average U.S. company loses **\$3 million each year** to the effects of negativity in the workplace.
Bureau of Labor Statistics, 2014
- This translates into an estimated loss of up to **\$300 billion each year** in productivity nationwide.
Gallup Organization, 2014

Financial Impact of Depression

Estimated Mean Missed Work Days and Annual Loss Resulting From Absenteeism Among U.S. Workers Diagnosed With Depression

Controlling for age, gender, income, education, race, marital status, region, and obesity status

	Estimated missed work days per year	Additional missed work days per year compared with those without depression	Estimated number of U.S. workers	Estimated cost of incremental absenteeism
Full-time workers with depression diagnosis	8.7	+4.3	13,076,559	\$19,032,180,580
Part-time workers with depression diagnosis	13.7	+5.0	5,047,161	\$4,261,536,828
TOTAL			18,123,720	\$23,293,717,408

Gallup-Healthways Well-Being Index

* Assumes 120,720,000 full-time and 30,480,000 part-time workers

** \$341 per missed work day is based on (inflation adjusted) research published in The Journal of Occupational and Environmental Medicine (Goetzel et al) 2003; 45(1), 5-14.

Poor Coping Behaviors

- Over-reliance on prescription drugs
- Alcohol / cannabis / substances
- Overeating / fats / carbohydrates / sugar
- Excessive television / video gaming
- Tobacco
- Excessive shopping
- Gambling
- Pornography



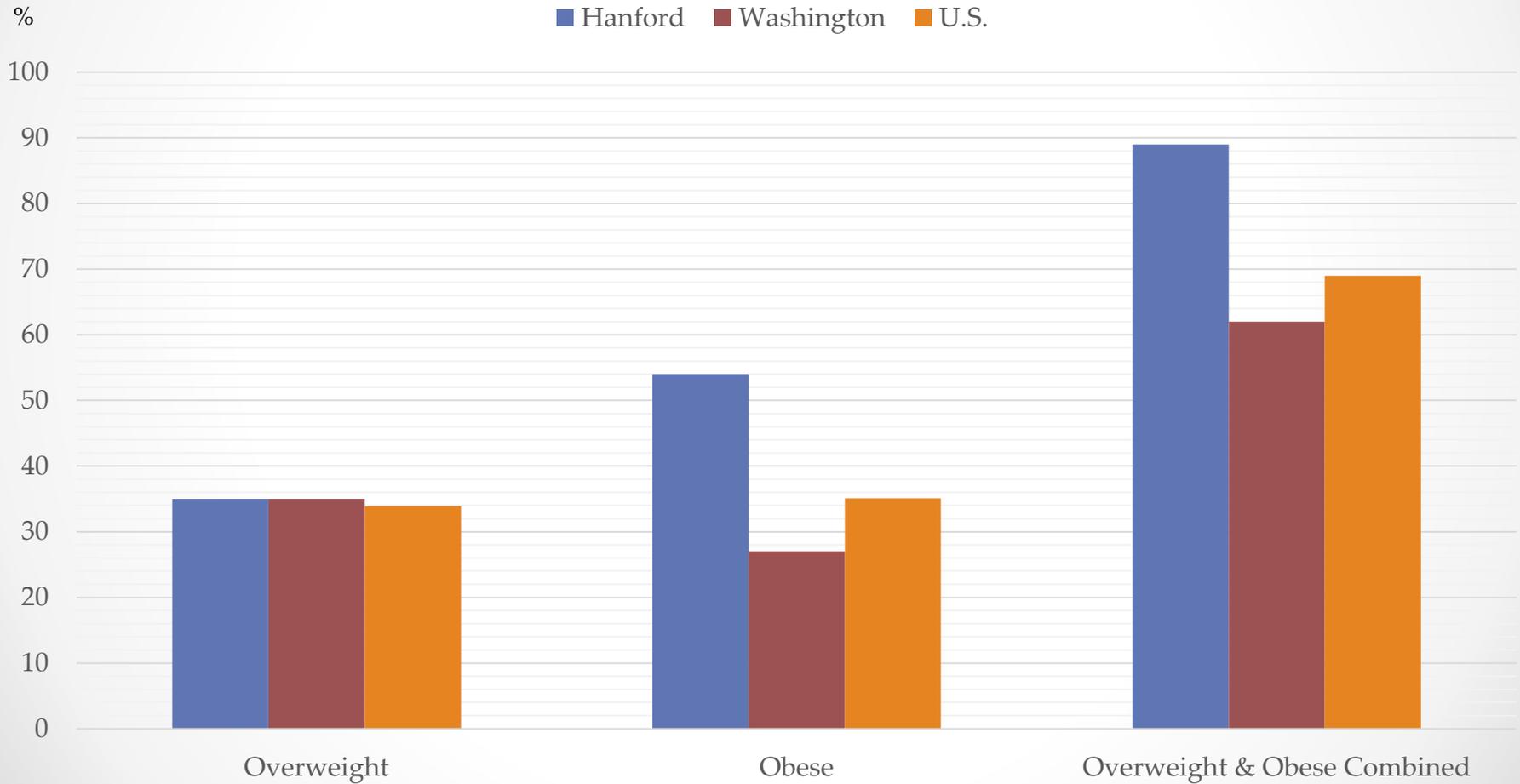
Health Impact of Poor Coping



- **\$162 billion** spent in 2011 in U.S. buying beer, wine, & liquor.
- **8.5%** of adults 18 years & older diagnosed with a **substance use disorder**. *DSM 5, 2013*
- **68.5%** of adults are **overweight/obese**.
- **Obesity rates have more than doubled** in adults and children since the 1970s.

National Center for Health Statistics, 2009

Overweight & Obesity at Hanford



Sources accessed 3/9/15

CDC <http://www.cdc.gov/nchs/fastats/obesity-overweight.htm>

Hanford N=5581, HPMC, 2014.

WA State DOH <http://www.doh.wa.gov/DataandStatisticalReports/DiseasesandChronicConditions/Obesity>

Absenteeism & Obesity



Centers for Disease Control & Prevention

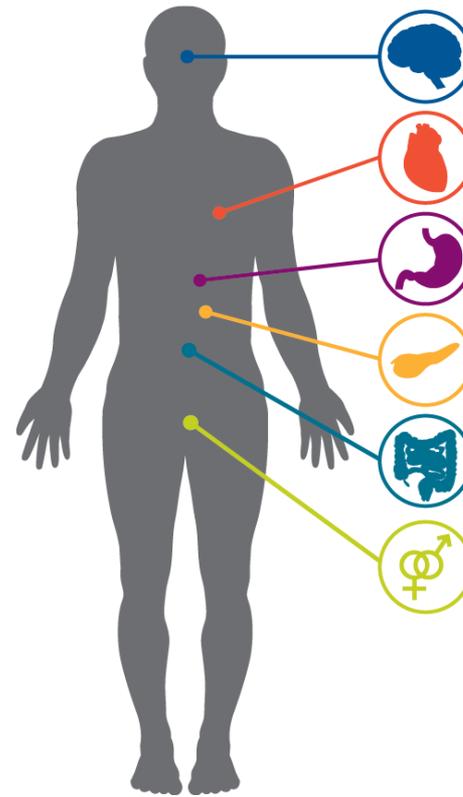
Am J Health Promot. 1998;12 (3): 202–207 and 2005; 20(1): 45-51

- **Overweight & obese** men miss approximately 5 days / year vs. **average** weight men miss 3 (**56% increase**).
- **Obese** women miss approximately 5.2 days / year vs. **average** weight women miss 3.9 (**53% increase**).

Physical Health Problems

- Hypertension
- Heart disease
- Asthma
- Obesity
- Type II diabetes
- Chronic pain
- Headaches
- Gastrointestinal disorders (IBS, ulcers)
- Accelerated aging

Effects of Stress on the Body



Brain and Nerves: Headaches, feelings of despair, lack of energy, sadness, nervousness, anger, irritability, trouble concentrating, memory problems, difficulty sleeping, mental health disorders (anxiety, panic attacks, depression, etc.)

Heart: Faster heartbeat or palpitations, rise in blood pressure, increased risk of high cholesterol and heart attack

Stomach: Nausea, stomach ache, heartburn, weight gain, increased or decreased appetite

Pancreas: Increased risk of diabetes

Intestines: Diarrhea, constipation and other digestive problems

Reproductive Organs: For women-irregular or painful periods, reduced sexual desire. For men-impotence, low sperm production, reduced sexual desire

Other: Acne and other skin problems, muscle aches and tension, increased risk for low bone density and weakened immune system (making it harder to fight off or recover from illnesses)

Financial Impact of Physical Health Problems

Centers For Disease Control & Prevention

“These diseases are among the most prevalent and/or costly chronic diseases.”

Chronic Disease Cost Calculator, 2013

- Arthritis
- Asthma
- Cancer
- Cardiovascular disease (CVD)
- Congestive heart failure (CHF)
- Coronary heart disease (CHD)
- Hypertension
- Stroke
- Depression
- Diabetes

Diminished Cognitive Functioning

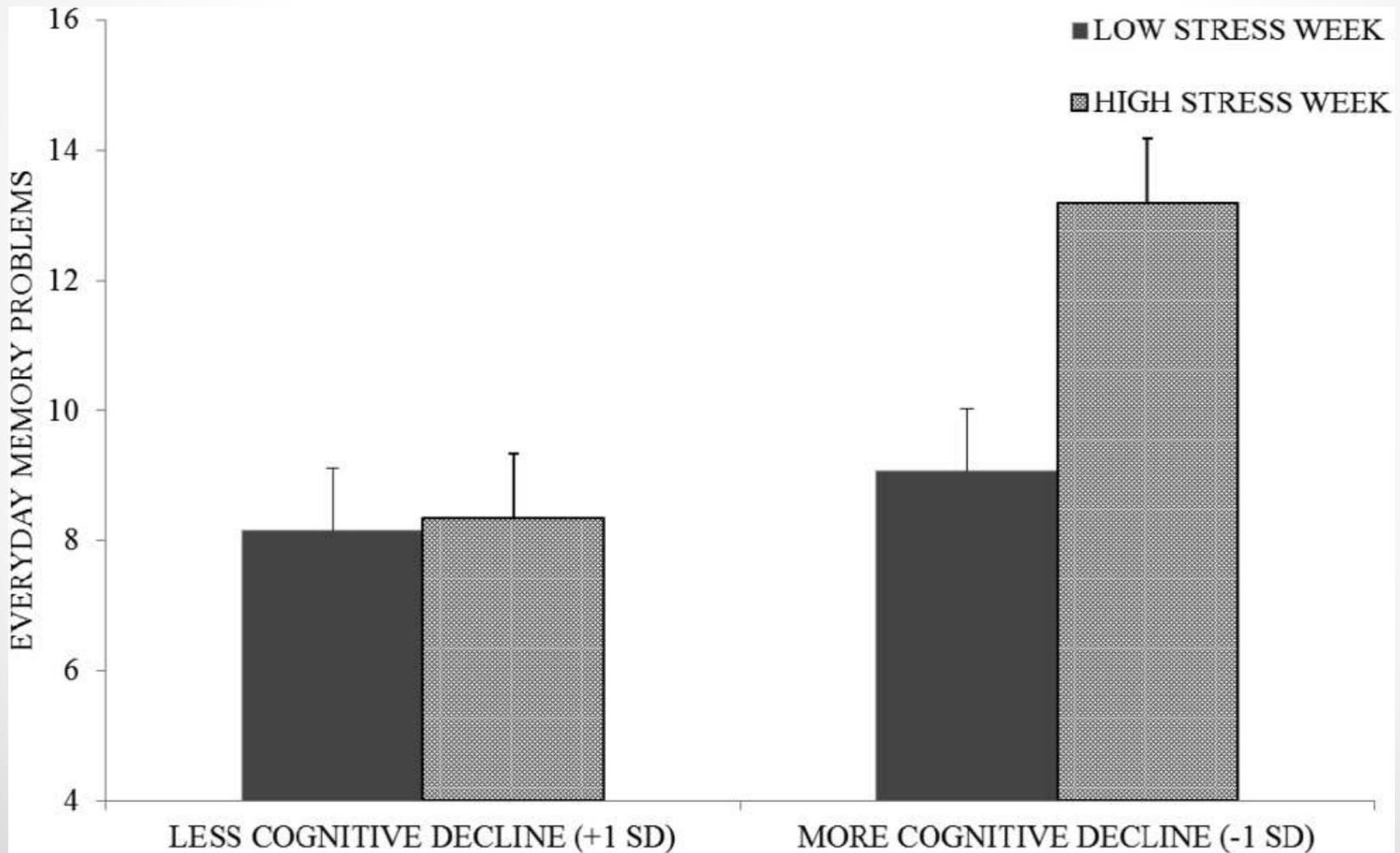
“Daily stress magnifies everyday memory problems.”

Rickenbach et al., 2014

- N=112 Participants completed diaries of daily stressors and everyday memory problems for 12 consecutive weeks.
- Participants provided 4 saliva samples to assess physiological stress identified by salivary cortisol.



Combined Effect of Aging & Stress on Cognition



Physiology of Stress & Cognition

The stress-brain loop

chronic stress

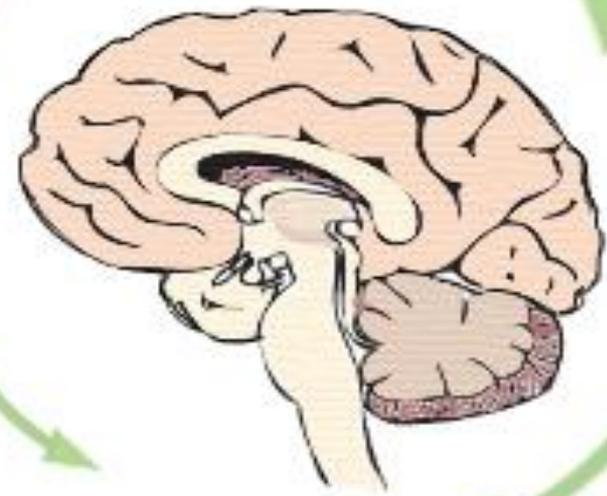
- inadequate sleep
- poor nutrition
- emotional distress

increases glucocorticoids

decreased regulation of cortisol

- ↓ attention
- ↓ perception
- ↓ short-term memory
- ↓ learning
- ↓ word finding

cellular changes in the hippocampus



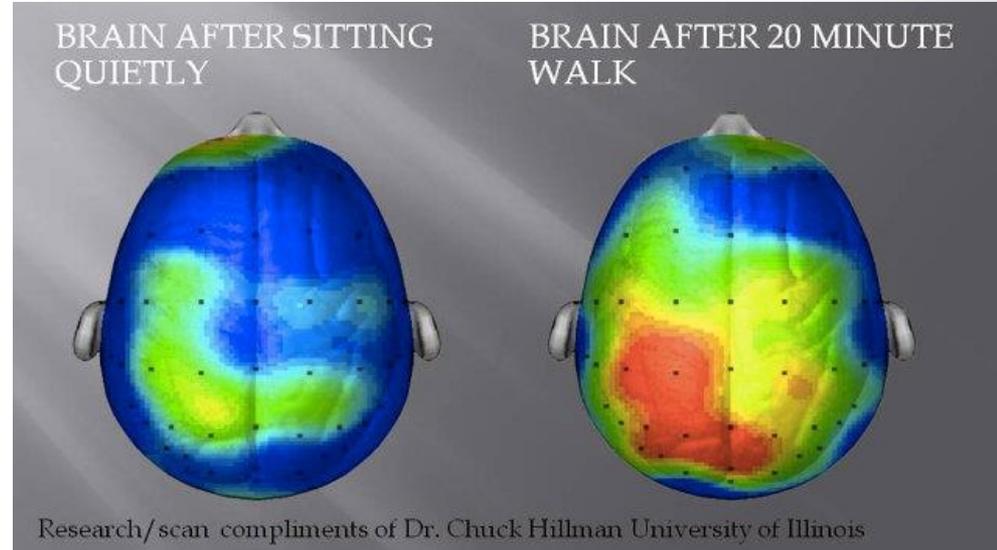
Physiology of Stress & Mood

- Chronic excess stress on the hypothalamus, pituitary, adrenal (HPA Axis) is believed to result in structural changes in certain parts of the brain. For example, [region CA3 of the hippocampus](#) loses large numbers of neurons when subjected to prolonged stress.
- Chronic **stress** and/or high levels of **glucocorticoids** alter certain **serotonergic receptors** (increases the 5-HT_{2A} receptors in the cerebral cortex and reduces the 5-HT_{1A} receptors in the hippocampus).



Evidence Based Intervention

- “The link between **EXERCISE** and **MOOD** is pretty strong. Usually within 5 minutes of moderate exercise you get a mood enhancement effect.” *Otto, 2011.*



- **Epidemiological data:**
“Physically active people have lower rates of anxiety and depression than sedentary people.”

Randomized Controlled Study

DUKE UNIVERSITY

- N=202 Sedentary adults diagnosed with major depression assigned to one of 4 experimental groups:
 1. Supervised exercise
 2. Home-based exercise
 3. Antidepressant medication
 4. Placebo pill



Duke's Remission Rates of Major Depression



- 45% Supervised exercise
- 40% Home-based exercise
- 47% Medication (Sertraline)
- 31% Placebo ill

Blumenthal, 2007

- At 1-year follow-up; aerobic exercise on MDD remission was similar to Sertraline after 4 months of treatment.
- Continued exercise during the follow-up period extended the short-term benefits during the study and may augment the benefit of antidepressant use.

Hoffman et al., 2011

Meta-Analytic Findings

- 2010 Meta-analytic review
- 29 studies included
- N=2049
- Supervised aerobic exercise
- Non-aerobic exercise control group



“Aerobic exercise training is associated with modest improvements in attention and processing speed, executive function, and memory.”
Smith et al., 2010

- 2011 Literature Review
“It’s clear that exercise has a positive effect on the body and the brain.”
Voss et.al. 2011, Journal of Applied Physiology

- 2013 Literature Review
“Physical activity has a role not only in keeping, but improving, cognitive functioning throughout life.”
Machado, 2013, Psychonomic Bulletin and Review

More Strategies for Managing Stress



- Adequate **sleep**.
- Take **care of your health**, consider adding vitamins/supplements.
- Self-care and **nurturance** (i.e., massage, yoga, music, arts).
- Cut out self-destructive coping (i.e., **reduce alcohol**, unhealthy foods).
- Establish **healthy boundaries/limits** with negative personal &/or work relationships.

Workplace Partnerships



- Potential to significantly improve **productivity** and overall business **performance** via improved mood, cognition, & health.
- Establish **workplace policies** that encourage & enable employees to engage in physical activity as part of their normal work week.

For More Information or Individual Consultation

HPMC OCCUPATIONAL
MEDICAL SERVICES

Behavioral Health Services
(509) 376-5060

Questions or Thoughts?