

## Ch 9

### Skill Related Fitness and Comprehensive Fitness Programming

#### Skill Lab – Handout

\*

#### Pedometer Project Due July 6

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### Skill-Related Fitness Components



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### Skill Based Components of Fitness

- 1) **Agility:** The ability to change the position of the body quickly and accurately.
- 2) **Balance:** The ability to maintain equilibrium while moving or while stationary.
- 3) **Coordination:** The ability to perform motor tasks accurately and smoothly using body movements and senses.
- 4) **Power:** The ability to exert force rapidly, based on a combination of strength and speed.
- 5) **Reaction Time:** The ability to respond or react quickly to a stimulus.
- 6) **Speed:** The ability to perform a movement in a short period of time.

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### Gymnastics

#### Skill-Related Fitness At Its Best

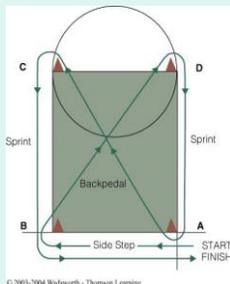


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- **Agility**
  - double back somersault
- **Balance** –
  - Handstand, balance beam, parallel bars
- **Coordination**
  - Integration of multiple skills
- **Power and Speed**
  - Propulsion of the body in the air when tumbling
- **Reaction time**
  - To rapid changes in body movements

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### Skill-related Fitness Performance Tests Agility



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- **Agility**
  - The ability to change body position and direction quickly and efficiently.
- **SEMO Agility Test**
  - Test to measure general body agility by using sidestepping, backpedaling, and sprinting on a basketball court.

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### Skill-related Fitness Performance Tests Balance

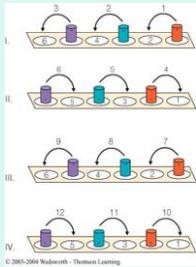


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- **Balance**
  - Ability to maintain the body in proper equilibrium.
- **One Foot Stand Test**
  - Test to measure static balance of one leg on a smooth floor.

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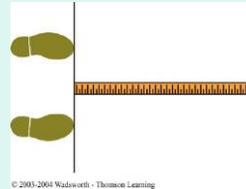
## Skill-related Fitness Performance Tests Coordination



- **Coordination**
  - The integration of the nervous and muscular systems to produce correct, graceful, and harmonious body movements.
- **Soda Pop Test**
  - Test to assess overall motor/muscular control and movement time using soda pop can movement.

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## Skill-related Fitness Performance Tests Power



- **Power**
  - The ability to produce maximum force in the shortest time.
- **Standing Long Jump Test**
  - Test to measure leg power in a double-armed forward jump.

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## Skill-related Fitness Performance Tests Reaction Time



- **Reaction Time**
  - The time required to initiate a response to a given stimulus.
- **Yardstick Test**
  - To measure hand reaction time in response to the visual stimulus of dropping a yardstick.

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## Skill-related Fitness Performance Tests Speed



- **Speed**
  - The ability to rapidly propel the body or a part of the body from one point to another.
- **50-Yard Dash**
  - To measure speed of displacing the body 50 yards after a stimulus.

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## Exercise Dosage for Heart Protection



- Expending 2,000 calories per week as a result of physical activity.
- 300 calories per daily exercise session.

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## Specific Exercise Considerations

Condition	Exercise Recommendations and Treatments
<b>Asthma</b>	Treatments include medication, slow changes in exercise intensity, and warm/humid environments.
<b>Arthritis</b>	Regular aerobic activity supplemented with flexibility and strength training. Low impact activities are preferred. Gradually increase intensity and duration.
<b>Diabetes</b>	Never exercise alone and wear an identification bracelet. Consume the proper amount of carbohydrate or inject the appropriate dose of insulin into non-exercising muscle.
<b>Pregnancy</b>	Exercise mild to moderately (~75% of pre-pregnancy intensity). Avoid supine positions after the first trimester and focus on non weight bearing exercises.

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### WHEN SELECTING SHOES

**TIPS FOR ACTION**

- Choose shoes according to your specific activity.
- Be sure the shoes have good stability, motion control, durability, and fit.
- Get fitted for shoes in the middle of the day when your feet have expanded and may be one-half size larger. (Also, each foot may be a different size.)
- To allow the feet to breathe, choose shoes with nylon or mesh uppers (cooler).
- Buy shoes at a reputable shoe store where the salespeople are knowledgeable. Expect to pay more for a good shoe.
- Break in new shoes slowly. Examine your shoes closely after six months or so, as that is the point at which many shoes begin to lose their cushioning. Replace your shoes when they wear out.
- For special conditions (unusual foot width; rigid, high arch; flat feet; obesity; pronation; toe shape), ask an expert to assist you. An evaluation from a podiatrist may be necessary.
- Ask to test-drive the shoes on a noncarpeted surface to help you determine the amount of comfort and cushion of the shoes.

**HEEL COUNTER**  
Rigid cup that surrounds and stabilizes the heel

**COLLAR**  
Consists of soft material that wraps around and protects the Achilles tendon

**UPPER**  
Should consist of breathable material such as nylon mesh

**EXTERNAL STABILIZER**  
Supports the base of the heel counter for extra stability

**MIDSOLE**  
Absorbs most of the shock to the heel strike upon push-off. Losses its shock-absorbing ability at approximately 500 miles of use

**TOE BOX**  
Should be wide and tall enough to provide room for the toes to spread comfortably

**OUTSOLE**  
Made of durable solid rubber or carbon rubber; protects the midsole and provides traction

Source: Adapted from Frank Rizzo, "Jogging and Walking for Health and Fitness" (Watson, 1995). Photo courtesy of Nike, Inc.

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## Exercise-Related Injuries

<h3>Hot Weather Injuries</h3> <ul style="list-style-type: none"> <li>Heat cramps</li> <li>Heat exhaustion</li> <li>Heat stroke</li> </ul>	<h3>Cold Weather Injuries</h3> <ul style="list-style-type: none"> <li>Frostbite</li> <li>Hypothermia</li> </ul>
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## Symptoms of Heat Illness

- Decreased perspiration
- Cramping
- Weakness
- Flushed skin
- Throbbing head
- Nausea/vomiting
- Diarrhea
- Numbness in the extremities
- Blurred vision
- Unsteadiness
- Disorientation
- Incoherency

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## Common Causes of Exercise-Related Injuries

- High impact activities
- Rapid conditioning programs
- Improper shoes or training surfaces
- Anatomical predisposition

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## Exercise-Related Injuries

<b>Acute Sports Injuries</b>
<b>Muscle Soreness and Stiffness</b>
<b>Exercise Intolerance</b>
<b>Side Stitch</b>
<b>Shin Splints</b>
<b>Muscle Cramps</b>

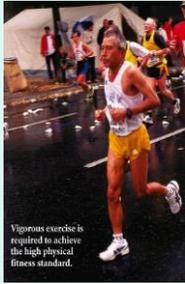
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## RICE Concept for Treatment of Acute Injury

<b>R</b>	<b>Rest</b>
<b>I</b>	<b>Ice application</b>
<b>C</b>	<b>Compression</b>
<b>E</b>	<b>Elevation</b>

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## Muscle Soreness and Stiffness



- **Cause**
  - Reduced blood flow to the muscles, general muscle fatigue, muscle micro-tears, muscle spasms, muscle overstretching, or tearing of connective tissue.
- **Treatment**
  - Mild stretching, low intensity exercise and warm baths

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## Exercise Intolerance

### **Signs and Symptoms**

- Irregular heart rate
- Difficulty breathing
- Nausea or vomiting
- Lightheadedness
- Headache or dizziness
- Flushed or pale skin
- Extreme weakness
- Sore muscles or cramps

### **Preventative Measures**

- Exercise in your target heart rate zone
- Listen to your body
- Get medical clearance to exercise



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## Shin Splints

### **Cause**

- Lack of proper and gradual conditioning
- Hard surface activity or improper shoes
- Fallen arches
- Chronic overuse of legs
- Faulty posture
- Weight-bearing activities when overweight

### **Treatment**

- Remove or reduce the cause.
- Stretch and ice the lower leg before and after activity.
- Apply whirlpool or hot bath heat for 15 minutes, 2-3 times per day.
- Apply tape for compression of affected area.

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## Muscle Cramps

### **Cause**

- Sweating induced water/electrolyte loss.
- Muscle fatigue.
- Lack of calcium.
- Inhibiting of blood flow with tight clothing.



### **Treatment**

- Stretch the muscle to reduce the cramp.
- Rub the area after reducing the cramp.
- Lightly exercise the area to increase blood flow.
- Supplement with calcium.
- Remove tight clothing.

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## Inactivity and Aging

### **The Effects of Aging on Sedentary Adults**

- VO<sub>2</sub>max (the body's ability to increase the transport & use of O<sub>2</sub>) decreases 1% each year.
- Muscle strength declines 10-20% between ages 20-50 and another 25-30% between ages 50 and 70.
- Flexibility drops about 5% each decade of life.
- Body fat levels increase and muscle mass declines.

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## The Benefits of Exercise in the Aging Population

- Enhanced functional capacity.
- Decreased risk of disease.
- Improved health status.
- Increased life expectancy.
- Retarding muscle loss.
- Preservation of cognitive function.
- Reduced incidence of depression.
- Improved self confidence and self esteem.



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## Base Fitness Conditioning

### Pre-activity screening

6 week period of training the health-related fitness components, including cardiorespiratory endurance, muscular strength and endurance, flexibility, and recommended body composition.

Moderate to high intensity aerobic exercise for 20+ minutes, 3 to 5 times per week.

Strength train 3 times per week at a resistance that allows 8-12 repetitions to near fatigue for three sets per body part.

Stretch 2-3 days per week, holding each stretch for 10-30 seconds

Body composition fitness goals:  
12-20% for men and 17-35% for women

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## Common Signs and Symptoms of Overtraining

- Decreased fitness and sports performance
- Increased fatigue
- Loss of concentration
- Staleness and burnout
- Loss of competitive drive
- Increased resting and exercise heart rate

- Decreased appetite
- Loss of body weight
- Altered sleep patterns
- Decreased sex drive
- Body aches and pains
- Increased susceptibility to illness and injury
- Mood disturbance

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## Personal Health Resources

- **American Council on Exercise**  
– <http://www.acefitness.com>
- **Fitness Jumpsite**  
– <http://www.primusweb.com/fitnesspartner>
- **President's Council on Physical Fitness and Sports**  
– <http://www.hoptechno.com/book11.htm>
- **Fitness Testing and Goal Setting**  
– <http://www.dce.ttu.edu/courses>
- **Fitness Online**  
– <http://www.fitnessonline.com/index.asp>



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## POP QUIZ

- Respond to the following questions:
- What is “eustress”?
- What is the General Adaptation Syndrome?
- What is the name of this chapter?
- How stressed are you?

## Ch 10

### Stress Assessment and Management Techniques

**Labs 10A, 10B, 10C Due (TEXT)**

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## Stress Basics

- **Stressors** are any physical or psychological event or condition that produces stress
- Situations may trigger physical & emotional reactions
- **Stress response** is the physiological and emotional response to stressors
- **Nervous** and **endocrine** systems produce physical reactions to stressors

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## Physical Responses to Stress

- Autonomic nervous system (digestion, heart rate, breathing, blood pressure, etc.)
  - ✓ parasympathetic (relaxed state – digesting food, storing energy, promoting growth)
  - ✓ sympathetic (fight-or-flight reaction – in emergencies)
- Endocrine system
  - ✓ releases hormones: cortisol (*hydrocortisone*), epinephrine (*adrenaline*), norepinephrine (*noradrenaline*)

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## Physical Responses to Stress

### FIGHT or FLIGHT Reactions

- ✓ Hearing & vision become more acute
- ✓ Heart accelerates to pump more oxygen
- ✓ Liver releases extra sugar for energy to muscles & brain
- ✓ Perspiration increases to cool skin
- ✓ Endorphins released to relieve pain in case of injury

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## Physical Responses to Stress

- When stress is ended the parasympathetic division returns body to homeostasis – vital functions return to normal
- Soreness can result the day after
- In today's society – many stressors (all not appropriate – traffic, test anxiety) can effect the “fight or flight” reaction
- Physical responses may be the same, but emotional responses will vary

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## Emotional Responses to Stress

- Anxiety, depression, fear
- Controlled by the somatic nervous system
- Effective responses include: talking, laughing, exercising, meditating – promotes wellness
- Ineffective responses include: using tobacco, alcohol, drugs, overeating – can be detrimental
- Influenced by our personality (type-A react explosively vs. “hardy” personality react mildly)
- Past experiences (giving a speech),
- Gender (♀ vs. ♂) & cultural background also have an impact

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## Stress and Disease

- Long-term stress linked to:
  - ✓ increase in cardiovascular disease
  - ✓ impairment of immune system
  - ✓ digestive problems
  - ✓ tension headaches
  - ✓ insomnia and fatigue
  - ✓ injuries
  - ✓ depression and other psychological problems

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## General Adaptation Syndrome

- General Adaptation Syndrome (**GAS**) - Described by *Hans Selye* as “a universal and predictable response pattern to stressors”
- Two categories of stress:
  1. **eustress**: stress triggered by pleasant stressor
  2. **distress**: stress triggered by unpleasant stressor
- Three predictable stages:
  1. **Alarm** – body is more susceptible to disease or injury – geared to deal with crisis
  2. **Resistance** – allows person to deal with added stress
  3. **Exhaustion** – If previous two are persistent or many – can lead to life threatening exhaustion (mental distortions or disorganized thinking)

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## Allostatic Load

- Allostatic Load – the long-term wear and tear of the stress response
- Depends on one’s genetics, life experiences, emotional, and behavioral responses to stress
- Can be due to frequent stressors, poor adaptation to common stressors, inability to shut down stress response
- High Allostatic Load is linked to heart disease, high BP, obesity, reduced immune system functioning
- If your Allostatic Load exceeds your ability to cope, you are more likely to get sick.

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## Stress and Disease/Illness

- **Psychoneuroimmunology (PNI)** – study of the interactions among the nervous system, the endocrine, system, and the immune system.
- Stress impairs the the immune system and can affect one’s health (colds, asthma attacks)
- Can lead to digestive problems, tension headaches, insomnia, reproductive complications
- **Cardiovascular disease** – elevated blood pressure and be a result of a stressor due to constricted blood vessels & elevated heart rate – leads to stroke, heart attacks, and death

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## Common Sources of Stress

- ✓ Major life changes (divorce, early adulthood – new relationships/breakups)
- ✓ Daily hassles (Atlanta traffic)
- ✓ College stressors (retain a scholarship)
- ✓ Job-related stressors (boss, salary, job performance, burnout)
- ✓ Interpersonal and social interactions (family & friends)

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## Tools for Managing Stress

- Social support (**sharing of feelings**)
- Clear communication (**express yourself**)
- Regular exercise in moderation (**better adaptation to stress**)
- Good nutrition (**avoid caffeine & “stress formula” vitamins – they don’t work to reduce stress**)
- Learn to manage your time

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## Time-management Strategies

- Time-management skills (avoid overcommitment, procrastination, & boredom)
- Set priorities and realistic goals
- Budget enough time
- Create short-term goals
- Visualize achievement
- Do least-favorite task first
- Consolidate tasks and delegate responsibility
- Learn to say “No!”
- Give yourself a break
- Just do it!!



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## Cognitive Strategies for Stress Management

- **Modify expectations** (avoid unrealistic expectations)
- **Monitor self-talk** (minimize/avoid hostile, critical, self deprecating thoughts)
- **Live in the present** (don't worry about the past or what's not under your control)
- **Be flexible** (go with the flow – can't do everything for everyone)
- **Laugh!** (humor can be therapeutic – triggers endorphins)

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## Relaxation Techniques

- Trigger the **relaxation response** through:
  - ✓ Progressive relaxation (tense & relax muscles – tells body to reduce the stress response)
  - ✓ Visualization (imagery – used in sports to enhance performance)
  - ✓ Deep breathing (deep, slow breathing promotes relaxation)
  - ✓ Music – newborns & stroke victims have benefited from music

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## Relaxation Techniques

- ✓ **Meditation** – quieting or emptying the mind
- ✓ **Hatha Yoga** – promotes the “union” of mind, body, and soul
- ✓ **Tai Chi** – good health results from a balanced “chi” – the energy force that surrounds and permeates all things
- ✓ **Biofeedback** – becoming more aware of one's level of physiological arousal
- ✓ **Hypnosis/self-hypnosis** – mental focusing intensifies– helps one to feel something other than stress
- ✓ **Massage** – subdues the stress response

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## Personal Health Resources

- **KSU Counseling & Psychological Services**  
<http://www.kennesaw.edu/studentsuccessservices/cps/>



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## Ch 11

### Preventing Cardiovascular Disease Cardiovascular Health Handout

\*

**Personal Fitness Report Due  
July 15  
with Original Contract**

\*

**Link to Suggested Final HPS 1000 Material**

<http://ksuweb.kennesaw.edu/~tdonovan/HPS%201000/Suggested%20HPS%201000%20Final%20Material.doc>

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## Major Forms of Cardiovascular Disease (CVD)

1. Hypertension
2. Atherosclerosis
3. Heart disease and heart attacks
4. Stroke
5. Congestive heart failure

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## Congestive heart failure (CHF)

- Congestive heart failure (CHF) is the leading cause of hospitalization among patients over 65. CHF occurs when the flow of blood from the heart (cardiac output) decreases, or fluid backs-up behind the failing ventricle, or both.
- Signs and symptoms of heart failure can be subtle and may include:
  - shortness of breath, which can happen during mild activity
  - difficulty breathing when lying down
  - weight gain with swelling in the legs and abdomen from fluid retention
  - fatigue and weakness

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## Coronary Heart Disease Risk Factors

- Abnormal cholesterol profile (Low HDL or High LDL)
- Physical Inactivity
- Smoking
- Hypertension (High BP)
- Personal history of heart disease
- Abnormal stress electrocardiogram
- Diabetes
- Family history of heart disease
- Age
- Excessive body fat
- Tension and stress
- Abnormal resting EKG
- Elevated triglycerides

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## Major Risk Factors That Can Be Changed

1. Tobacco use (1 pack /day = twice the risk of heart attack as non-smokers; 2+ packs/day triples the risk; Smokers more likely to die from heart attack)  
Women who smoke & use the “pill” = 39 times more likely to have heart attack & 22 times more like to have a stroke
2. High Blood Pressure (Hypertension)

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## Major Risk Factors That Can Be Changed

3. Unhealthy cholesterol levels (HDL = “good” cholesterol – helps bring unused cholesterol back to liver for recycling;  
LDL = “bad” cholesterol – excess leads to blockage of arteries - Best way to lower – cut total fat (saturated) intake; increase fiber
4. Physical inactivity (25% of adults don't exercise & 60 % don't reach recommended amount of exercise) Exercise is the “magic bullet”
5. Obesity (30% above recommended weight)

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## Contributing Risk Factors That Can Be Changed

- 1) Diabetes – Can lead to increased risk factors for CVD
- 2) Triglyceride (Blood Fats) levels –  
400mg/dl = high; Best way to lower: Lose weight; exercise; increase fiber; lower simple sugars & refined carbohydrates.
- 3) Psychological factors  
stress, chronic hostility and anger, suppression of psychological distress, depression, anxiety
- 4) Social factors  
social isolation, low socioeconomic status

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## Major Risk Factors That Cannot Be Changed

- Heredity - CVD seems to be inherited
- Aging
  - increased risk (55%) of heart attacks after age 65
- Being male
- Ethnicity
  - African Americans have much higher risks of developing CVD

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## Warning Signs of a Heart Attack



**Discomfort, pressure, fullness, squeezing, or pain in the middle of the chest that persists for several minutes and may be intermittent.**

**Pain that radiates to the shoulders, neck, or arms.**

**Chest discomfort with lightheadedness, shortness of breath, nausea, sweating, or fainting.**

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## Symptoms for Heart Attacks in Women

These six heart attack symptoms are common in women:

- 1) **Chest pain** - "truly uncomfortable." Chest pain is the most common heart attack symptom, but some women may experience it differently than men. Can be pain anywhere in chest area. Feels like a vice being tightened.
- 2) **Pain (gradual or sudden) in your arm(s), back, neck, or jaw.** It can wake you up if sleeping.
- 3) **Stomach pain** – like an elephant sitting on the stomach.
- 4) **Shortness of breath, nausea, or lightheadedness.** Trouble breathing – but have not done anything.
- 5) **Sweating** – a nervous, cold sweat – not the same as from exercising or being outside in heat.
- 6) **Fatigue** – even if sitting for a while – complain of "tiredness in the chest."

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## Warning Signs of a Stroke

**Sudden numbness or weakness of the face, arm, or leg – particularly on one side of the body**

**Sudden confusion, difficulty in speech or understanding**

**Sudden trouble seeing out of one or both eyes**

**Sudden trouble walking, dizziness, or loss of balance or coordination**

**A sudden severe headache of unknown cause**

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## Stroke Detection

- Sometimes symptoms of a stroke are difficult to identify (facial weakness, arm weakness and speech problems).
- Unfortunately, the lack of awareness spells disaster. The stroke victim may suffer brain damage when people nearby fail to recognize the symptoms of a stroke. Now doctors say a bystander can recognize a stroke by asking simple questions/actions:
  - 1) Ask the individual to **SMILE**.
  - 2) Ask him or her to **RAISE BOTH ARMS**.
  - 3) Ask the person to **SPEAK A SIMPLE SENTENCE** (Coherently) (i.e. **It is sunny out today.**)
  - 4) Ask the person to **STICK OUT HIS/HER Tongue**. If the tongue is "crooked," if it goes to one side or the other, that also is an indication of a stroke.

If he or she has trouble with any of these tasks, **call 911 immediately** and describe the symptoms to the dispatcher.

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## Another way to remember stroke signs

**F.A.S.T.** is an easy way to remember the sudden signs of stroke. When you can spot the signs, you'll know that you need to call 9-1-1 for help right away.

**F.A.S.T.** is:

**F** - Face Drooping – Does one side of the face droop or is it numb? Ask the person to smile. Is the person's smile uneven?

**A** - Arm Weakness – Is one arm weak or numb? Ask the person to raise both arms. Does one arm drift downward?

**S** - Speech Difficulty – Is speech slurred? Is the person unable to speak or hard to understand? Ask the person to repeat a simple sentence, like "The sky is blue." Is the sentence repeated correctly?

**T** - Time to call 9-1-1 – If someone shows any of these symptoms, even if the symptoms go away, call 9-1-1 and get the person to the hospital immediately.

**Check the time so you'll know when the first symptoms appeared.**

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## Blood Pressure

**Definition:** A measure of the force exerted against the walls of the vessels by the blood flowing through them.

### **Systolic Blood Pressure**

Pressure exerted by blood against walls of the arteries during forceful contraction of the heart.

### **Diastolic Blood Pressure**

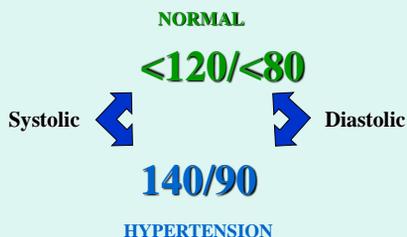
Pressure exerted by blood against the walls of the arteries during relaxation of the heart.



Sphygmomanometer & Stethoscope

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## Blood Pressure Standards



*Definition:* Chronically elevated blood pressure.

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This chart reflects blood pressure categories defined by the American Heart Association. \* Your doctor should evaluate unusually [low blood pressure](#) readings.

Blood Pressure Category	Systolic mm Hg (upper #)	and	Diastolic mm Hg (lower #)
Normal	less than 120		less than 80
Prehypertension	120 – 139	or	80 – 89
High Blood Pressure (Hypertension) Stage 1	140 – 159	or	90 – 99
High Blood Pressure (Hypertension) Stage 2	160 or higher	or	100 or higher
<b>Nonsevere (urgent) (Emergency care needed)</b>	Higher than 180	or	Higher than 110

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## Guidelines to Stop Hypertension

- Participate in moderate-intensity aerobic exercise for 30-45 minutes, 5 to 7 days per week.
- Participate in a moderate resistance training program 2 times per week.
- Lose weight, if necessary.
- Limit foods high in sodium and increase the intake of foods high in potassium.
- Do not smoke.
- Practice stress management.
- Limit daily alcohol intake to 2 drinks for men and 1 drink for women.
- Follow the [DASH](#) (Dietary Approach to Stop Hypertension) diet.

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## Serum Cholesterol Guidelines

	Amount	Rating
<b>Total Cholesterol</b>	<200 mg/dl	Desirable
	200-239 mg/dl	Borderline high
	≥240 mg/dl	High risk
<b>LDL Cholesterol</b>	<100 mg/dl	Optimal
	100-129 mg/dl	Near or above optimal
	130-159 mg/dl	Borderline high
	160-189 mg/dl	High risk
<b>HDL cholesterol</b>	≥60 mg/dl	High (low risk)
	<40 mg/dl	Low (high risk)

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## LDL Cholesterol

Methods for **Lowering** Your "Bad" Cholesterol Levels

- Aim for 25-38 grams of fiber/day.
- Limit cholesterol intake to 200 mg/day.
- Consume 25 grams of soy protein/day.
- Consume red meats <3 times per week.
- Limit commercially baked foods.
- Limit foods containing hydrogenated fats.
- Increase your intake of omega-3 fatty acids.
- Use low fat dairy products.
- Limit egg consumption to 3 eggs per week.
- Bake, broil, grill, poach, or steam foods.
- Maintain recommended body weight.

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## Triglyceride (free fatty acids) Guidelines

- **Found in:**
  - Poultry skin, lunch meats, & shellfish
  - Also manufactured in liver from refined sugars, starches, and alcohol
  - High intake of sugars & alcohol raises triglycerides
- **Lowering Triglycerides**
  - Lower alcohol and refined sugar intake
  - Reduce overall fat consumption
  - Quit smoking
  - Reduce weight (if overweight)
  - Perform regular aerobic exercise

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## Triglyceride (free fatty acids) Guidelines

Amount	Rating
≤125 mg/dl	Desirable
126-499 mg/dl	Borderline High
≥500 mg/dl	High Risk

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## Homocysteine



- **Definition:** an **amino acid** that, when allowed to accumulate in the blood, **may lead to plaque formation and blockage of arteries.**
- Theorized effects of elevated homocysteine levels:
  - Damage to the inner lining of the arteries.
  - Stimulation of the proliferation of cells at damaged locations in arteries which contributes to plaque formation.
  - An increased incidence of blood clotting at injury sites in the arteries.
- Methods for reducing homocysteine levels:
  - 5+ servings of fruits and veggies everyday to ensure adequate B6 and folate consumption.

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## C-Reactive Protein

- **Definition:** A **protein** whose levels in the blood increase with **inflammation**, including inflammation of the cardiac muscle.
- Theorized effects of elevated C-reactive protein levels:
  - Increased incidence of cardiovascular events.
- **Tests for C-reactive protein:**
  - High sensitivity C-reactive protein (hs-CRP - test).
    - Measures the probability of plaque rupture within the arterial wall.

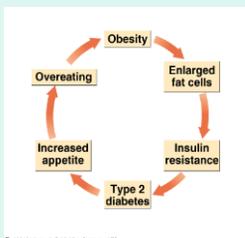
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## Diabetes Mellitus Facts

- **Definition:** Metabolic disorder of carbohydrate metabolism in which the body doesn't produce or utilize insulin properly.
- Affects more than 16 million people in the U.S.
- 800,000 new cases each year.
- 80% of diabetics die from heart disease.
- 85% of diabetics have impaired kidney function, loss of vision, or both.

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## Obesity-Type 2 Diabetes



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- Associated with overeating, obesity, and lack of physical activity.
- Prevention and treatment:
  - Regular exercise program.
  - Diet high in complex carbohydrates and water-soluble fibers, low in saturated fat, and low in sugar.
  - Low glycemic index foods
    - Grains, fruits, and vegetables.

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## Type I versus Type II Diabetes

### Type I Diabetes

- The pancreas is not producing insulin and the patient requires regular insulin injections.
- Only 5% of all diabetics.
- **Causes:** ? viral, genetics.

### Type II Diabetes

- The body is producing some insulin, but it is not able to use it effectively.
- 95% of all diabetics over age 20.
- **Causes:** excess body fat, genetics.

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## Metabolic Syndrome

- **Definition:** An array of metabolic abnormalities due to a chronic rise in insulin. Effects more than 30% over age 20 (@50 million).
- These conditions include (not limited to): abdominal obesity, low HDL-cholesterol, high triglycerides, elevated blood pressure, and an increased blood clotting mechanism.
- Prevention and treatment:
  - 45% of total calories from carbohydrates (high fiber foods with a low glycemic index)
  - 40% of total calories from fat,
  - 15% from protein.
  - Weight loss (if overweight).
  - Regular exercise.
  - Smoking cessation.

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## Stress Electrocardiogram

Graded Exercise Test or Maximal Exercise Tolerance Test



- Men >40 years.
- Women >50 years.
- Individuals with a total cholesterol >200 mg/dl or HDL <35 mg/dl.
- Hypertensive and diabetic patients.
- Cigarette smokers.
- Individuals with a family history of CV disease.
- People with abnormal resting ECGs.
- All individuals with symptoms of heart disease.

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## Smoking



- Smoking is the single most preventable cause of illness and premature death in the U.S.
- 20% of CV deaths are attributed to smoking.
  - Smoking speeds atherosclerosis,
  - promotes blood clotting,
  - decreases the blood's oxygen carrying capacity,
  - increases heart rate,
  - raises blood pressure,
  - decreases the good 'HDL' cholesterol,
  - irritates the heart.
- Smoking is also linked to:
  - Certain cancers, bronchitis, emphysema, and peptic ulcers.

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## Protection from Consumer Fraud or Be Careful What You Read/See

**Become an informed consumer.**

**Seek advice of a reputable professional.**

**Look for qualifications, degrees, professional experience, certifications and reputation.**

**If it looks too good to be true, it probably is.**

**Use refereed journals instead of newspapers, magazines, and trade books.**

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## Evaluating a Health and Fitness Club



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## Minimum Personal Trainer Qualifications



- Undergraduate degree in a fitness-related area
  - Exercise science or physiology, Kinesiology, sports medicine, or physical education
- Certification from a reputable organization
  - e.g. ACSM

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## Personal Health Resources

- **American Cancer Society**  
– <http://www.cancer.org/>
- **National Cancer Institute**  
– <http://www.nci.nih.gov/>
- **National Heart, Lung, and Blood Institute**  
– <http://www.nhlbi.gov/index.htm>
- **National Institutes of Health**  
– <http://www.nih.gov/>
- **American Diabetes Association**  
– <http://www.diabetes.org>



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