W.I.T.S. Personal Trainer Certification
Lecture Five:
Special Populations, Behavioral Change, Injury Prevention and Treatment and Legal Issues

Exercise and Women’s Health

• Pregnancy.
• Osteoporosis.
• Female athlete triad.

Pregnancy and Exercise

• Potential problems
  – Heat dissipation.
  – Oxygen delivery.
  – Nutrition supply.
  – Premature delivery.
• Absolute and relative contraindications for exercise during pregnancy.
  – Refer to page 356.
Pregnancy and Exercise

<table>
<thead>
<tr>
<th>Frequency</th>
<th>3-4 days per week</th>
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<tbody>
<tr>
<td>Intensity</td>
<td>Moderate intensity (RPE 12-14)</td>
</tr>
<tr>
<td>Time</td>
<td>Build to 150 min/wk (includes warm-up and cool-down)</td>
</tr>
<tr>
<td>Type</td>
<td>Rhythmic, dynamic activities that use large muscle groups</td>
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</tbody>
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Pregnancy and Exercise

- Avoid max exercise testing.
- Avoid exercise in a supine position after the first trimester.
- Avoid hot and humid environments and ensure adequate hydration.
- Limit exposure to falling and impact—center of gravity and balance change.
- Joint laxity increases—so prevent joint injury.
- Avoid extremes in air pressure.
- Be aware of warning signs.

Osteoporosis

- Bone mineral density (BMD) that is 2.5 standard deviations below the mean for young white women.
- Affects 10.2 million women over 50.
  - Another 43.4 million have osteopenia.
- Most common sites of osteoporotic fractures: hip, vertebra, wrist.
- Bone mineral density (BMD) measured by dual-energy X-ray absorptiometry.
Osteoporosis: Risk Factors

- Female
- Older age.
- Estrogen deficiency.
- Caucasian or Asian race.
- Low weight or BMI.
- Diet low in calcium.
- Alcohol abuse.
- Inactivity and/or muscle weakness.
- Family history of osteoporosis.
- Smoking.
- History of fracture.

Exercise and Osteoporosis

- Prevention: maximize bone accumulation during childhood and adolescence.
- Exercise alone may not be adequate to prevent age-related bone loss; however, exercise is essential in slowing this condition.
- Regular participation in high-intensity load bearing activities should be encouraged.

ACSM Guidelines for Osteoporotic Adults

- Weight-bearing endurance activities
  - 3 to 4 days per week
- Resistance training
  - 2 or 3 days per week
  - 60% to 80% 1RM
- Duration of 30 to 60 minutes
  - Aerobic and RT combined
Female Athlete Triad

- Includes three interrelated components: energy availability, bone health, and menstrual status.
- Low energy availability is often associated with eating disorders or unhealthy eating patterns.
- Anorexia nervosa and bulimia nervosa are eating disorders frequently seen in the female athlete triad.

Exercise and Heart Disease

- Cardiovascular disease (CVD) is the leading cause of death in the United States.
- Coronary heart disease (CHD) results from reduced blood flow in the coronary arteries.
Coronary Heart Disease

- Death rate from CHD has declined in recent decades.
- 1.26 million myocardial infarctions (MIs) in 2010.
- 80% survival rate.

Atherosclerosis

- Thickening of the artery wall that blocks blood flow.
- Deposits impede blood flow in the affected arteries, sometimes to the point of complete occlusion.
- Blockages can cause reduced blood flow to the heart, MI, stroke, or claudication.
- Hypertension (high blood pressure) greatly increases the risk of developing CVD.
Benefits of Exercise for CHD

- Improved cardiovascular function
- Increase VO$_2$ max values, increase work rates achieved without ischemia, and increase capacity for prolonged work.
- Reduce body fat, blood pressure, total cholesterol, serum triglycerides, and LDL–C, along with increase HDL–C.
- Cardiac rehab program generally lower the risk of a second heart attack.

Exercise Prescription

- Fitness professionals often encounter clients who have gone through a cardiac rehab program.
- Fitness professionals working with clients who have been through cardiac rehab should have some knowledge of what their client has been through.

Exercise Prescription

Fitness professionals must work with a team of medical professionals and must have knowledge of cardiovascular medications.
Cardiac Rehab

- Phase I CR: Acute or inpatient phase (1-3 days post-MI or procedure)
  - Education, bedside activities, and slow hallway ambulation
- Phase II and III: Conducted outpatient but in a hospital setting

Cardiac Rehab Phase IV

- Maintenance Phase
  - Frequency: 3 to 5 days per wk
  - Intensity: Moderate intensity= 40% to 80% of VO$_{2}$max or RPE 12-16 on a 20 point scale
  - Duration: 20 to 60 min per day
  - Type: prolonged, rhythmic, dynamic exercises using large muscle groups
  - 5 to 10 minutes of warm up and cool down
  - Be aware of medications!

Cardiac Rehab Phase II

- Phase II CR: initial outpatient program (typically last 12 weeks) in a hospital setting
  - Patient education classes (eating, stress, behavior change)
  - Aerobic (endurance) conditioning
    - Frequency: 3 or 4 days per week
    - Intensity: 40% to 75% (initially) of VO$_{2}$max or HRR**
    - Time: 20–40 min per day (5–10 min warm-up and cool-down)
    - Type: treadmill, cycle, stepping, rowing, stair climbing, light to moderate resistance training (see ch. 13)
  - Careful monitoring of HR, BP, ECG, glucose
Exercise and Obesity

- Excessive adiposity and can be documented by examining the relationship between height and weight (BMI) or by evaluating percent body fat.

- Generally accepted guidelines for classifying obesity using %body fat:
  - > 38% for women.
  - > 25% for men.

Potential Causes

- More complex than just consuming an excess in calories.
- Biological and psychological factors can contribute to obesity.
- The imbalance between energy intake and expenditure ultimately leads to fat accumulation.
- Prevalence of obesity in the U.S. is rising.
- Obesity rates among children are increasing.
Obesity is linked with:
- Increased mortality and morbidity
- Coronary heart disease, congestive heart failure
- Type 2 diabetes mellitus
- Hypertension
- Dyslipidemia
- Gallbladder disease
- Osteoarthritis
- Some cancers
- Sleep apnea and respiratory problems

Physical Activity and Obesity
- Leisure-time and workplace physical activity are inversely associated with obesity.
- 45 to 60 min of daily moderate activity is needed to prevent obesity.
- Both exercise and dietary modification should be used to

Special Medical Screening
- Comorbidities necessitates careful screening.
- Testing should be individualized.
- Be aware of any medications and their possible effects.
- Starting intensities and incremental increases should be appropriate for the individual.
Exercise Prescription: ACSM Recommendations

- Frequency: 5 to 7 days/week
- Intensity: Moderate (40% – 60% HRR), with progression to higher intensity (50% to 75% HRR)
- Duration: progress from 30 to 60 min/day. Multiple daily bouts of 10 minutes or longer may be used.
- Type: aerobic exercise targeting large muscle groups and resistance exercise.

Exercise Prescription

- Healthy weight-loss goals. An appropriate goal is .5 to 1 kg/week.
- Diets with fewer than 1,200 kcal/day are not recommended.
- Individualized program.

Exercise Prescription

- Refer to a hospital based pulmonary rehab program if severely symptomatic.
- Modes: walking, cycling and swimming.
- Frequency: 3 to 5 days/wk for at least 30 min
- Intensity is challenging as they cannot achieve the same peak HRs.
- Use a dyspnea rating scale.
- Intermittent exercise with rest.
- Upper body exercise to increase arm strength and endurance.
Questions/Discussion?

Transtheoretical Model of Behavior Change

- Model of intentional behavior modification.
- Emphasizes motivation, readiness to change, and personal history regarding the target behavior.
- Different strategies motivate people to take action.
- Components:
  - Stages of Change
  - Attitudes, beliefs, and skills for change.

Components of Model: Stages of Change

- Precontemplation
- Contemplation
- Preparation
- Action
- Maintenance
Components of Model: Attitudes, Beliefs and Skills

- Self-efficacy
- Decisional balance
- Process of change

Applying the Transtheoretical Model

Match the appropriate intervention strategy according to the person's physical activity history and readiness to change.

Promoting Exercise: Early Stages

- Targeting individuals in the early stages of change.
- Advancing Precontemplators and contemplators.
- Precontemplators:
  - Sedentary and have no plans to exercise. They may lack information, possibly negative attitude towards exercise.
  - Strengthen perception about the benefits of exercise and develop a personal value for exercise.
Promoting Exercise: Early Stages

- Sedentary individuals move to the contemplation stage if the information is convincing, personal and timely.
- Increasing knowledge about the health benefits of exercise and being aware of how one's inactivity affects others, are critical in these early stages of change.

Influencing Exercise Adoption: Preparation Stage

- Doing some exercise, but not enough to meet health and fitness guidelines.
- Help the client move to the action stage and regular exercise.
- Assess personal, social, and environmental factors that support their current level of activity.

Personal Factors that Support Exercise

- Demographics
- Activity history
- Past experience
- Perception of health
- Perception of access to facilities
- Time
- Perceived behavioral control
- Enjoyment of exercise
- Skills
- Beliefs
- Self-motivation
- Self-efficacy
- Intrinsic motivation
Social Factors that Support Exercise

- Comfort, assistance, information.
- Exercise in a group.
- Support from family.

Environmental Factors that Influence Exercise

- Accessible facilities
- Fewer (real or perceived) barriers
- Convenience of exercise
- Lack of time (actual or perceived)

Enhancing Adherence: Action and Maintenance Stage

- Assessment
- Self-monitoring
- Goal setting
- Reinforcement
- Behavior contracts
- Relapse prevention
Assessment

- Fitness and psychosocial assessments.
- Reassess periodically.
- Identifying motivation.
- Setting realistic goals.
- Identifying high risk situations.

Self-Monitoring

- Individual records information, thoughts, feelings, and situations before, during, and after the behavior.
- Participant can identify motivators.
- Barriers become evident.

Goal Setting

- Accomplish a specific task in a specific time frame.
- Goals should be behavioral, specific and measurable.
- Goals should be reasonable and realistic.
Reinforcement

• Social and self reinforcement are crucial in the action phase.
• Social support should provide positive reinforcement.
• Self-reinforcement should involve rewards that are important to the individual.

Behavioral Contracts

• Written, signed, public agreements to engage in specific goal-directed behaviors.
• Used effectively to increase adherence.
• Clear and realistic objectives and deadlines.
• Consequences of meeting and not meeting goals.

Relapse Prevention

• Relapse occurs when people stop exercising.
• Relapse is likely for many people.
• Relapse does not mean failure.
• Define high risk situations that may cause relapse.
• Identify strategies for dealing with high risk situations.
• Determine strategies for preventing relapse.
Health and Fitness Counseling

- Communication skills
- Being an effective helper
  - Empathy
  - Respect
  - Concreteness
  - Genuineness
  - Confrontation

Injury Prevention and Treatment

Be aware of inherent risks associated with activity and control factors that increase the risk of injury.

Emergency Action Plan (EAP)

- A written document used to facilitate and organize employee actions during workplace emergencies
- Staff emergency training should be conducted at least four times a year
- Three basic components
  1. Trained EAP personnel
  2. Communication plan
  3. Access to emergency equipment
Emergency Action Plan (EAP)

- All fitness professionals should be certified in CPR and review it on a regular basis
- All fitness professionals should practice emergency scenarios to prepare
- Ensure access to a phone at all times
- Check emergency equipment and supplies frequently

Contributing Factors to Injury

- Increased frequency and intensity.
- Increased speed, quick changes in direction, and increased focus on smaller muscle groups.
- Environmental conditions and lack of adaptation to the environment.
- Age, sex, and body structure influence the risk of injury.

Reducing Injury Risk

- Proper and comprehensive screening.
- Emergency planning.
- Properly designing and implementing fitness programs.
- Educating participants about proper intensity, signs and symptoms of overuse and overexertion, and gradual progression.
Injury Treatment

• Soft Tissue Injuries
  • Sprain: overstretching or tearing of ligament
  • Treat using PRICE:
    – Protect, Rest, Ice, Compression, Elevation
    – Use of heat in later stages of acute injury and to reduce muscle spasms.

Soft Tissue Injury Treatment

Chronic versus acute injury

• Chronic: prolonged or lingering; generally, symptoms last over 6 weeks
• Acute: sharp, intense pain or injury that rapidly reaches a crisis

P.R.I.C.E

• Used in the treatment of acute soft-tissue injuries:
  • Protect
  • Rest
  • Ice
  • 15 to 20 minutes; reapply hourly or when pain persists
  • For use during the first 24 to 48 hours, depending on severity
  • Compress (often a wet wrap)
  • Elevate (above heart level)
Soft Tissue Injury Treatment

- Use of cold
  - Decreases swelling and inflammation
  - Reduces pain due to swelling
  - Reduce bleeding
- Use of heat
  - Increases circulation
  - Reduces pain and promotes muscle relaxation
  - Used in later stages of recovery once chance for swelling has diminished

Delayed Onset Muscle Soreness (DOMS)

- Caused by placing unaccustomed loads on muscles
- Microscopic breakdown of muscle tissue causing an inflammatory response over several days (12–72 hours after exercise)
- To minimize or avoid pain and soreness give muscles the opportunity to adequately recover and adapt

Bone Injuries

- Fractures
  - Injuries to bone.
  - Control bleeding; elevate, control swelling with pressure and ice, splint above and below the joint.
- Simple fracture
  - Bone fracture without external exposure
- Compound fracture
  - Bone fracture with external exposure
Wounds and Skin Disorders

- Concerns with an open wound and skin irritations are bleeding and infection.
- Use universal precautions in treating an open wound.
- Protective gloves should be worn.
- Proper disposal of infectious materials and decontamination of infected areas should follow.

Environmental Concerns: Pollution

- People with asthma, severe allergies or breathing problems may be affected by pollutants or allergens in the air.
- Breathing may become difficult due to decreased capacity to transport oxygen to the tissues.
- Avoid training during times of peak pollution.

Environmental Concerns: Heat–Related Problems

- Inefficient cooling mechanisms, certain medications, high intake of salt or alcohol and exercising with a fever or in heat and humidity may cause heat–related disorders.
- Heat illness is potentially deadly.
- Proper hydration is key to prevention.
Environmental Concerns: Cold-Related Problems

- Exercise in cold, rainy weather or when windchill factor is high may lead to cold-related disorders.
- Avoid exposure to extreme cold.
- Wear removable layers.
- Warm up before activity and remain constantly active.

Diabetic Reactions

- Diabetic coma (hyperglycemia): loss of consciousness caused by too little insulin (gradual onset)
- Insulin shock (hypoglycemia): anxiety, excitement, perspiration, delirium, or coma caused by too much insulin or not enough carbohydrate to balance insulin intake (rapid onset)
- Treat by providing a sugar substance (orange juice, candy, honey) as soon as possible

CPR and Emergency Procedures

- Be certified in CPR and AED.
- In addition, establish a plan of action for emergency procedures.
- Be prepared. (carry cell phone, have medical history available.)
- Remain calm.
- Determine the history of injury.
- Check vital signs: HR, breathing, BP, bleeding.
Basic Life Support and Emergency Procedures

1. Heart rate: ~60–100 beats/min at rest
2. Breathing: ~8–20 breaths/min at rest
3. Blood pressure: <120/80 mmHg
4. Body temperature: normally 98.6 °F

Legal Issues for Fitness Professionals

- Participation in fitness activities can lead to injuries, which can lead to legal claims and lawsuits.
- To help minimize injuries and litigation, fitness professionals should be aware of the relevant laws.

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<tr>
<th>Table 6.3</th>
<th>Frequent Injury Claims Occurring in Fitness Facilities</th>
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<tbody>
<tr>
<td></td>
<td>Number of claims</td>
</tr>
<tr>
<td>Number modification</td>
<td>388</td>
</tr>
<tr>
<td>Premise liability (slipping and falling)</td>
<td>314</td>
</tr>
<tr>
<td>Equipment malfunction</td>
<td>136</td>
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<tr>
<td>Slips and falls in wet areas</td>
<td>252</td>
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<tr>
<td>Trips and slips</td>
<td>213</td>
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</table>

Data from Smith/Stone, Hackett, and Conquy, 2008.
Injuries and Negligence

- Inherent risks: Simply happen, no one is at fault.
- Negligence: Someone is at fault.
  - Participant, professional, facility.
- Product liability: Equipment malfunction—manufacturer may be at fault.

Negligence is the major legal concern for fitness professionals.

- Failure to do something that a reasonable, prudent professional would do.
- Doing something that a reasonable, prudent professional would not have done under the same circumstance.

Proving Negligence

- Four Elements
  - Duty: determined by judges
  - Breach of duty
  - Causation: breach of duty was cause of damage or harm
  - Harm and damages: harm occurred, resulting in damages
Defense Against Negligence

- **Primary assumption of risk:**
  - Demonstrate that you informed the participant of the inherent risks.
- **Use of informed consent form.**
- **Use of waiver form.**
- **Waiver defense**
  - Defense based on contract law.
  - Individual gives up civil right to recover damages for *ordinary* negligence.
- **Some waivers are not enforceable in certain states (do not modify or alter).**

Federal Laws and the Fitness Profession

1. **Americans with Disabilities Act**
2. **Occupational Safety and Health Administration’s Bloodborne Pathogens Standard**
3. **Health Insurance Portability and Accountability Act (HIPAA)**
   - Privacy
   - Confidentiality
   - Security

Risk Management

- **Proactive process to help minimize liability losses and reduce accidental losses.**
- **Four steps**
  1. Assess liability exposure
  2. Develop risk management strategies
  3. Implement risk management plan
  4. Evaluate risk management plan
Minimizing Legal Liability

• Personnel
  – Hire, train, and supervise competent employees properly.
  – Purchase proper liability insurance.
  – Have procedures in place for independent contractors

Minimizing Legal Liability

• Pre-activity Screening.
  – Select preactivity screening processes and devices (HHQ, PAR-Q+).
  – Have qualified fitness professionals interpret data from screening processes.
  – Develop procedures for medical clearance and risk classification.

Minimizing Legal Liability

• Fitness Testing and Prescription.
  – Develop scope of practice guidelines for fitness professionals.
  – Use a medical liaison and resources for people with risk factors.
  – Develop scope of practice guidelines for anyone providing nutrition advice.
Minimizing Legal Liability

• Instruction and Supervision.
  – Provide orientation to the facility and equipment to all new participants.
  – Provide staff supervision during all operating hours.
  – Conduct job performance appraisals of all fitness staff members.
  – Provide proper supervision of youth programs.

• Equipment and facility.
  – Install exercise equipment properly.
  – Maintain exercise equipment properly.
  – Have a system in place to monitor facility access.
  – Conduct regular inspections of premises.
  – Post signage throughout the facility.

• Emergency Action Plans.
  – Prepare a written emergency plan.
  – Ensure emergency plan includes AED procedures.
  – Have qualified staff trained to carry out emergency action.
  – Establish post-emergency procedures (documentation)
Questions/Discussion?