

Arizona Peace Officer Standards and Training

Basic Curriculum Lesson Plan

LESSON TITLE: PHYSICAL FITNESS - SECTION 5 EXERCISE AND SAFETY 8.3

SUBJECT: Section 5

AZ POST DESIGNATION: 8.3.5

HOURS: 1.5

INSTRUCTOR TO STUDENT RATIO:

COURSE CONTENT: Through lecture and discussion, this course of instruction covers common exercise-related injuries due to hot weather training, cold weather training and overtraining.

PERFORMANCE OBJECTIVES: Upon completion of this course of instruction, students using notes, handouts and other support materials as references, within the allotted time, will be able to:

8.3.5.1. Identify the three (3) heat stress complications.

8.3.5.2. Identify the two (2) cold-related disorders.

8.3.5.3. Identify the symptoms of overtraining.

8.3.5.4. Define R.I.C.E. (Rest – Ice – Compression – Elevation).

DATE FIRST PREPARED:	February 2004	
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AZ POST – APPROVAL:	Richard Watling	DATE: June 2004
AZ POST – APPROVAL:	Lori Wait	DATE: March 2022

LIST ANY PREREQUISITES:

LEAD INSTRUCTOR:

BACK-UP INSTRUCTOR(S):

INSTRUCTOR REFERENCES: Physical Fitness Specialist Course Manual compiled by the Cooper Institute of Aerobic Research, Dallas, Texas. Revised 2007.

CLASS LEVEL: Instructor

TRAINING AIDS: Computer-aided slides on PowerPoint software and computer and projector or overhead projector.

INSTRUCTIONAL STRATEGY: Instructional objectives will be obtained through the use of lecture, reading assignments and group discussion.

SUCCESS CRITERIA: Success in this functional area will be demonstrated through the attainment of a 70% passing grade on a written objective examination comprised of multiple-choice and true/false questions.

COMPUTER FILE NAME: 8.3.5 Sec 5 Exercise and Safety

DATE RELEASED TO THE SHARE FILE: May 27, 2022

I. INTRODUCTION

- A. Instructor(s) – (self) introduction.
- B. Preview of performance objectives.

II. HOT WEATHER TRAINING

- A. How the body dissipates heat.
 - 1. Conduction – heat transfers from one (1) solid object to another, warm to cool.
 - 2. Radiation – loss of heat in the form of infrared rays.
 - 3. Convection – heat transfer from the body to the surrounding air. The air must be cool; moving air facilitates convection tremendously.
 - 4. Evaporation – evaporation of sweat results in heat loss. This is the major way in which heat dissipates in warm weather.
- B. Hypothalamus.
 - 1. The body's thermostat.
 - 2. Controls sweating.
- C. Acclimation.
 - 1. Takes approximately 10-14 days. (Discuss the heat index; high humidity, makes heat more dangerous.)
 - 2. Hypothalamus makes the adjustment to regulate sweat. (Because it slows the evaporation of perspiration - the body's natural cooler; explain the chart.)
- D. Complications from heat stress.
 - 1. Heat cramps.
 - a. Signs:
 - i. Severe muscle cramps, usually in the abdomen and legs.
 - ii. Exhaustion, to the point of collapse.
 - iii. Dizziness or periods of faintness.

- b. Treatment:
 - i. Move to a cool place.
 - ii. Replenish with fluids, electrolytes.
 - iii. Massage the cramped muscle or apply pressure.

- 2. Heat exhaustion.
 - a. Signs:
 - i. Profuse sweating, weakness, dizziness, the skin is cool and wet and the body temperature is usually elevated.
 - ii. Possible nausea and vomiting and headache.

 - b. Treatment:
 - i. Move to a cool place.
 - ii. Replenish with fluids, electrolytes.
 - iii. Seek medical attention for serious cases.

- 3. Heat stroke.
 - a. Signs:
 - i. The body temperature is greatly elevated, central nervous system impairment, confusion, loss of balance, incoherent speech, delirium, dizziness and loss of consciousness.
 - ii. Sweating profusely; hot, dry skin present.

 - b. Treatment:
 - i. Activate EMS immediately.
 - ii. Move to a cooler environment; wet clothing or remove. Heat stroke is life threatening: the body temperature must be lowered **as soon as possible** or brain cells will die.
 - iii. Place ice packs under the armpits, wrists, ankles, neck and groin.
 - iv. Monitor pulse and respiration; initiate CPR, if necessary.

- D. Dehydration – loss of water content and electrolytes needed for normal body function. (Hyponatremia is a low concentration of sodium in the blood. Additional H₂O dilutes the bloodstream further and can be serious, even deadly.)
1. Effects of dehydration:
 - a. Decreased coordination.
 - b. Fatigue.
 - c. Impaired judgment.
 - d. Dry mucous membranes.
 - e. Poor skin elasticity.
 - f. Excessive thirst.
 2. Preventing dehydration:
 - a. Drink plenty of water regularly and often. Fluids from the day before hydrate your next day's activity.
 - b. Drink fluids even if you are not thirsty.
 - c. Avoid alcohol, caffeine or other diuretics.
 - d. Wear lightweight, light-colored clothing during exercise.
 - e. Rest often, out of the sun.
 - f. Eat small meals and eat more often. Avoid salt tablets.

III. COLD WEATHER TRAINING

- A. How the body acclimatizes to cold weather:
1. Resting metabolic rate increases.
 2. Less blood is delivered to the skin.
 3. Blood flow increases to the hands and feet.
 4. Shivering occurs.

5. Increase in brown adipose tissue. (A dark-colored fatty tissue in many mammals, especially hibernating animals and human babies that produces heat in order to control body temperature.)
- B. Guidelines for cold weather training:
1. Dress in layers using a moisture-wicking base.
 2. Become acclimated.
 3. Be aware of the chill factor. If it is colder than - 20degrees, exposed skin can freeze within 60 seconds.
 4. Avoid alcohol; drink plenty of fluids.
 5. Keep moving.
 6. Cover exposed skin in wind-chill conditions.
 7. Seek or know of a nearby shelter.
 8. Individuals with cardiovascular disease should avoid heavy exertion. (shoveling snow.)
- C. Frostbite.
1. Early:
 - a. Skin is slightly flushed.
 - b. Initial pain or numbness.
 - c. Blisters may appear.
 2. Severe:
 - a. Numbness spreads.
 - b. Impaired judgment and confusion.
 - c. Coordination diminishes.
 - d. Loss of eyesight or consciousness.
 - e. Shock; can be fatal.
 3. Treatment:

- a. Never rub a frozen area.
- b. Use gauze to separate fingers and toes.
- c. Remove wet clothing; move to a warmer environment.
- d. Use blankets, clothing and/or warm water, if available.
- e. Provide CPR if necessary; activate EMS.
- f. Do not apply hot water bottles, heat lamps or direct heat.
- g. If conscious, give warm, non-alcoholic fluids.

D. Hypothermia.

1. Low body temperature, shivering, numbness, weakness and drowsiness.
2. Severe – body temperature is below 95°, uncontrollable shivering, loss of coordination, confusion, unconsciousness and death.

IV. INJURY PREVENTION

A. Principle of overload:

1. Frequency.
2. Intensity.
3. Time (duration).

B. Symptoms of overtraining:

1. Unexplained or unusual soreness.
2. Lowered resistance.
3. Colds, headaches, cold sores, etc.
4. Chronic fatigue.
5. Depression, frustration, etc.
6. Lowered coordination levels.

C. Prevention:

1. Alternate easy/hard days.
2. Proper warm-up and cool-down.
3. Use common sense.
4. Cross training.
5. Use equipment properly; use proper technique(s). (Valsalva maneuver - creating an extreme amount of pressure in the thoracic cavity by closing the glottis of the throat during exertion. i.e. holding your breath.)
6. Maintain desired body weight.
7. Improve strength, flexibility, endurance, etc.
8. Monitor intensity.

D. Common injuries:

1. Strain – an injury to a muscle or tendon.
2. Sprain – an injury to a ligament.
3. Torn meniscus – common knee injury; torn cartilage usually due to collision sports. (Medial meniscus is torn four (4) times more than lateral meniscus.)
4. Bursitis – inflammation of the bursa sac.
5. Patellofemoral Pain Syndrome (runner’s knee) – pain and stiffness around the knee cap.
6. Plantar Fasciitis – inflammation of the fascia; leads to heel spurs.
7. Shin splints – general term for anything that hurts along the front or side of the lower leg. Tendonitis or stress fractures are common.
8. Tendonitis – inflammation of the tendon.
9. Contusion – bruise.
10. Dislocations – displacement of bones forming a joint.

E. R.I.C.E:

1. Rest – reduce or stop using the injured area for 48 hours. If you have a leg injury, you may need to stay off of it completely.
 2. Ice – put an ice pack on the injured area for 20 minutes at a time, four (4) to eight (8) times per day. Use a cold pack, ice bag or a plastic bag filled with crushed ice that has been wrapped in a towel. (Use for acute injuries up to 48 hours. Chronic injuries may require heat.)
 3. Compression – compression of an injured ankle, knee or wrist may help reduce the swelling.
 - a. These include bandages such as: Elastic wraps, special boots, air casts and splints.
 - b. Ask your doctor which one is best.
 4. Elevation – keep the injured area elevated above the level of the heart. Use a pillow to help elevate an injured limb.
- F. Proper form.
1. Most important element for safe and effective training.
 2. Will minimize injury and ensure targeted muscle is isolated during movement.
 3. Three most common form issues are:
 - a. Speed.
 - i. Every exercise that works by moving weights – including your own body weight – should always be done with the weight under control. Move the weight slowly through your range of motion, and don't use momentum to lift the weight.
 - ii. If you find that you can't complete your sets at the proper speed you are using too much weight.
 - b. Range of motion.
 - i. Every exercise has a correct, or optimal range of motion. To a certain degree, however, your range of motion for a given exercise will depend on your own flexibility or history of injury.
 - ii. Always be sure to move the weight through the entire range of motion as outlined in the exercise description, so that all parts of your muscle benefit from the exercise.

- c. Isolation.
 - i. Every exercise is designed to work specific muscle group(s). When you recruit muscles not targeted by the exercise you are defeating the purpose of the exercise and robbing the target muscles of their workout.
 - ii. If you can't do the weight with the proper form you are lifting too much or your muscle is exhausted and you should stop.

G. Structural Alignment.

1. Proper alignment, form, and technique are crucial when it comes to the execution of an exercise.
2. When the body assumes a more natural alignment, it is able to perform its tasks with the greatest ease and power. This is supported by the laws of physics and conservation of energy.
3. As a general rule: make sure the hips and knees are moving correctly, the back has a natural arch, the head and chest are up, the chin is in alignment with the spine, the shoulders are in a neutral position, the core is tight and the knees do not protrude beyond the feet.

H. Rehabilitation:

1. Requires patience.
2. Perform rehabilitation exercises.
3. Regain full range of motion and strength prior to coming back from an injury.

V. CONCLUSION

- A. Review of performance objectives.
- B. Final questions and answers.
- C. Instructor closing comment(s).

