

LESSON PLAN
FOR
PHYSICAL TRAINING INSTRUCTOR TRAINING COURSE
CLASS F2 SCHOOL
P-9E-1238

PREPARED BY
NAVAL AVIATION SCHOOLS COMMAND
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SECURITY AWARENESS NOTICE

This course does not contain any classified material.

SAFETY/HAZARD AWARENESS NOTICE

All personnel must be reminded that personal injury, death, or equipment damage can result from carelessness, failure to comply with approved procedures, or violations of warning, cautions, and safety regulations.

Review fire and environmental emergency procedures with class.

CAUTION: Laser pointing devices may be used during this course, to include remote controls. Refer to NAVAVSCOLSCOMINST 5100.12

MISHAP/HAZARD REPORTING

a. Safe training is the number one goal. Mishaps can result in lost lives, and the unnecessary loss of thousands of manhours and millions of dollars. Mishaps can be prevented. For the most part, they are the result of actions performed incorrectly, either knowingly or unknowingly, by people who fail to exercise sufficient foresight, lack the requisite training, knowledge, or motivation, or who fail to recognize and report hazards.

b. A mishap is any unplanned or unexpected event causing personnel injury, occupational illness, death, material loss or damage or an explosion whether damage occurs or not.

c. A hazardous condition is any situation where if allowed to go unchecked or uncorrected has the potential to cause a mishap.

d. A near miss is when a mishap is avoided merely by chance.

e. It is the responsibility of all Department of Defense personnel to report all mishaps and near misses. If a mishap, hazardous condition or near miss occurs let your instructor know immediately.

f. Instructors will correct hazardous conditions, if able, immediately. If unable to correct the hazard condition on their own, the instructor will submit a work request and submit a report of unsafe/unhealthy working conditions to the command training safety officer via their division/departmental training safety officer. Instructors will ensure interim corrective action is implemented to protect personnel until the hazard is abated. Reports can be hand written on the appropriate form. Injuries will be reported on the appropriate form. In the event of a near miss the pertinent information will be submitted to the command training safety officer via their divisional/departmental training safety officer and include lessons learned.

NATRACOM DOR AND TRAINING TIME OUT POLICY

For Instructors:

1. Ensure all students are briefed on TTO policy and procedures prior to each high or moderate risk evolution or laboratory. For multi-day or all-day evolutions, TTO shall be rebriefed prior to the start of training following major breaks, such as mealtimes. Evolution-specific TTO procedures should be added where needed. These procedures should be standardized to conform with established fleet distress indicators where appropriate (e.g., standard small arms range procedures, diving distress signals, etc.). Emphasis shall be placed on specific verbal and nonverbal signals to be used by students and instructors.
2. A TTO may be called in any training situation where a student or instructor expresses concern for personal safety or requests clarification of procedures or requirements. TTO is also an appropriate means for a student to obtain relief if he or she is experiencing pain, heat stress, or other serious physical discomfort.
3. Instructors are responsible for maintaining situational awareness and shall remain alert to signs of student panic, fear, extreme exhaustion, or lack of confidence that may impair safe completion of the training exercise. Instructors shall cease training immediately when they consider such action appropriate.
4. Following a TTO, the situation shall be examined and additional explanation and instruction shall be provided as needed to allow safe resumption of training. Once the lead instructor on scene is fully apprised of the problem, he/she shall direct all training to cease or training with unaffected students to continue, based on the situation.
5. If a student refuses to participate in training after being instructed or after an unsafe condition has been corrected, or uses TTO excessively to disrupt training, that student shall be removed from training and referred for further counseling or administrative processing.

Basic TTO Student Briefing:

Any student or instructor in any training situation where they are concerned for their own or another's safety, or they request clarification of it, procedures or requirements may call a Training Time Out (TTO). TTO is also an appropriate means for a student to obtain relief if he or she is experiencing pain, heat stress, or other serious physical discomfort. The purpose of the TTO is to correct the situation of concern, provide clarifying information, or remove the student or instructor from the possible hazardous environment. A TTO may be signaled with the abbreviation TTO, the words Training Time Out, crossed hands in a (T), a raised clenched fist, or other specific signals which will be briefed prior to a specific lab, test, or exercise. If the TTO signal is not acknowledged, the signaler shall shout "Time Out" (or other action as required by the training activity). The instructor shall attempt to relieve and remove the student from the possible hazardous environment. If an adequate number of instructors are available to allow training to continue safely, the lead instructor may elect to do so. However, if this is not practical, training will be stopped until the situation is corrected.

DROP ON REQUEST (DOR)

For Instructors:

Ensure all students are briefed on DOR policy and procedures voluntary high/moderate-risk courses. The following briefing shall be given prior to commencing the course (i.e., course indoctrination, welcome aboard brief, etc.) and should not be repeated unless there is a long break in the course (e.g., Christmas holidays):

For Instructors and Students:

1. Policy. In all cases where a student states a desire to DOR from voluntary training based on concern for personal well-being, appropriate action shall be initiated, including removal from training, referral of the student for medical, counseling, or remedial action as appropriate, and review of the training environment, including training techniques. The scope and depth of these actions shall be determined by the nature of the complaint and the risk incurred in the training. A written summary of actions taken shall be made a permanent entry to the student's service record. In no case shall a student be coerced or threatened to induce him or her to return to training following a DOR.

2. Procedures. After removal from voluntary training, the student shall submit a written request detailing the reasons for DOR. The request should clearly indicate that the student wants to DOR (e.g., I, (name), desire to be removed from training in XYZ course for the following reason(s): ...). A standard Special Request/Authorization Form (NAVPERS 1336/3 (Rev. 9-75)) may be used. The request shall be submitted directly to the training or division officer and shall become a part of the student's training record. If a student was being processed for an Academic Review Board (ARB) action prior to the DOR, the ARB shall take precedence. In any case, the student shall be removed from training.

a. Training or Division Officer's Interview. The loss of an able student from training or the continuation in training of a student who is unlikely to complete the program represents a waste of valuable resources, assets, time, and effort. Often, students who DOR do not give the real or complete reasons for their requests. The interviewer, using no overt or implied coercion or threats, shall make a reasonable effort to determine:

(1) The real motivation for the request;

(2) If the decision to DOR is the result of some training factor which may lead other students to DOR. If so, can training be changed to alleviate this factor without adversely

affecting program objectives?

(3) If the student desires to reenter the program.

(4) If student retention is warranted, are there actions (counseling, change of instructor, or special assistance) which might cause the student not to DOR? Are such actions justified in view of the impact upon the overall training program and upon other students?

b. The interview need only be detailed enough to satisfy the CO, OIC, or DOT that the student understands the gravity of DOR, and that the reasons for the DOR are known or that further questioning is unlikely to reveal additional information.

c. No one in the DOR chain shall refuse to forward a request or to remove the student from training, nor shall anyone delay a request in an effort to arrive at the cause of the DOR, or threaten/coerce a student to reconsider.

3. Post-Interview Procedure. If, after the interview, a student still desires to DOR, the interviewer shall refer the him/her to the reviewing officer for further interviews or administrative action. A signed, written summary of the interview and recommended actions shall be provided by the interviewing officer to the reviewing officer.

4. Administrative Procedure. The administrative procedures for disposition of a DOR attrite are the same as those for a disenrollment. There is, however, no requirement for a formal ARB.

LESSON PLAN

JANUARY 2005

COURSE TITLE: Physical Training
Instructor Training Course,
P-9E-1238

TERMINAL OBJECTIVE:
Partially supported by this lesson topic:

CLASSIFICATION: Unclassified

LESSON TOPIC NUMBER: 1.1

LESSON TOPIC: Overview/Course
Introduction

ALLOTTED LESSON TIME: 2.0

INSTRUCTIONAL SUPPORT:

1 Classroom Instructor

INSTRUCTIONAL REFERENCES:

1. New Command Fitness Coordinator
Exercise Leader Handbook
2. CNETINST 1500.20D

INSTRUCTIONAL AIDS:

1. PowerPoint Presentation
2. Student Guide
3. Medical Screening Form
4. Drop on Request/Training Time Out
Form

1.0 Upon completion of this unit of instruction the Physical Training Instructor Under Training will demonstrate knowledge to instruct, demonstrate, and facilitate students in the NAVAVSCOLSCOM Physical Training Instructor (PTI) Course curriculum without injury to personnel or damage to equipment.

ENABLING OBJECTIVES:

Completely supported by this lesson topic:

- 1.1 State course overview and rules.
- 1.2 State Naval Air Station Pensacola (NASP) information.
- 1.3 State Naval Aviation Schools Command (NASC) information.
- 1.4 State safety requirements for physical training.
- 1.5 Identify areas of special concern for physical training.
- 1.6 Fill out medical screening form.
- 1.7 State/Define mishap, near-miss, and unsafe condition reporting Procedures.
- 1.8 State Drop On Request procedures.
- 1.9 State Training Time Out procedures.
- 1.10 Define wellness and fitness

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

CRITERION TEST:

None.

HOMEWORK:

None.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

INTRODUCTION

A. Establish Contact

Display name and lesson topic.

1. Introduce self, give rank, current job.
2. State background, schools, duty stations, etc.
3. State question and answer policy.

B. State Lesson Objectives

Turn to cover page of lesson plan and paraphrase objectives.

C. Establish Readiness

1. Motivating statements - In preparation to be a Physical Training Instructor you must become competent and achieve high levels of readiness in a variety of physical training areas. Increases in muscular strength and muscular endurance will certainly improve your ability to function effectively in the physical training environment.

Establish importance and relevance of lesson material using personal experience or anecdote.

2. Lesson overview

Briefly outline material to be covered.

a. Lesson Topic: Introduction/course overview

b. Major Teaching Points:

- (1) Course overview
- (2) Course rules
- (3) NASP information

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (4) NASC information
- (5) Safety requirements
- (6) Areas of special concern
- (7) Medical screening
- (8) DOR/TTO/Student safety
- (9) Mishap/Near-miss/Unsafe condition reporting procedures
- (10) Define wellness
- (11) Define fitness

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

PRESENTATION

A. Course overview

1. Physical training
 - (a) Aerobic
 - (b) Anaerobic
2. Risk Management
3. Sports Psychology
4. Stress Management
5. Beneficial/Non Beneficial Stretches and Exercises
6. Major Components of the Musculoskeletal System
7. Principles of Training
8. Pulmonary Structure and Functions
9. Injury Prevention and Hygiene
10. Cardiovascular System
11. Exercise in Extreme Environments
12. Swimming for a Lifetime of Fitness
13. Exercise Formula Guidelines
14. Circumference Measurements

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RELATED INSTRUCTOR ACTIVITY

15. Nutrition
16. Improving Swimming Speed
17. Shipboard Training
18. American Red Cross (ARC) Sport Safety Training

B. Course rules

1. Class leader -
2. Start times -
3. Classroom procedures and fire exits
4. Organizational clothing -
5. Personal effects -
6. Parking -

C. General information

1. NASP Gym
2. Chow Hall Hours -
3. NASC information
 - a. Gym
 - b. Pool
4. Safety

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D. Medical screening

1. Fill out medical screening form.

E. Lessons Learned/Safety Precautions

1. The most significant lesson for the PTI course is sports injury prevention.
2. A primary objective of the PTI course is to educate Physical Training Instructors in the proper use of the curricula. There will inevitably be injuries in a moderate risk course; following the curricula exactly will absolve instructors of blame.
3. Lessons learned for this specific course are minor.
 - a. Minor injuries have resulted when instructors who were not in good physical condition pushed themselves too hard.
 - b. Minor strain and sprain caused by improper stretching, warm-up exercises, and cool-down stretching.
 - c. Back injuries can happen when doing some exercises improperly.
 - d. Inform students in class of any known hazardous conditions that exist in the training environment.
 - e. Inform students of the location of emergency

DISCUSSION POINT

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equipment, fire exits, and the local procedures used in the event of a fire or other emergency.

4. Mishap/Near-Miss/Unsafe Condition Reporting Procedures

- a. A mishap is any unplanned or unexpected kind whether damage occurs or not.
- b. A near miss or hazardous condition is any situation which if allowed to go unchecked or uncorrected has the potential to cause a mishap.
- c. It is the responsibility of all Department of Defense personnel to report all mishaps, near misses, and any unsafe or unhealthy (hazardous) condition(s). If a mishap, hazardous condition or near miss occurs the student shall notify the instructor immediately. OPNAV 5100/11 Form with instructions are available for formal reporting.

Explain mishap and unsafe condition reporting options and locations of drop boxes for anonymous report submission.

F. Drop on Request (DOR)

The Physical Training Instructor Course is designated as moderate risk training and is voluntary. Accordingly, students have the option to individually request termination of training.

Read verbatim the DOR policy written in this curriculum's Front Matter Foreword on page iii or verbatim from CNET instruction 1500.20D.

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G. Training Time Out (TTO) Policy

A TTO may be called in training situation whenever a student or instructor expresses concern for personal safety or a need for clarification of procedures or requirements exists.

Discuss this policy thoroughly with the students. Emphasize DOR is in effect for the duration of the course.

Solicit questions.

Read verbatim the TTO policy written in this Curriculum's Front Matter Foreword on page iv or verbatim from CNET Instruction 1500.20D.

Instructors are responsible for maintaining situational awareness and shall remain alert to signals of student panic, fear, extreme exhaustion, or lack of confidence that may impair safe completion of the training exercise. Instructors shall immediately consider such action appropriate.

Following a TTO the training situation shall be examined and additional explanation/instruction will be provided as

DISCUSSION POINT

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necessary of training.

H. Define wellness

1. A multifaceted approach to optimal health that emphasizes the individual's deliberate effort to stay healthy and achieve the highest potential for well being.
2. Wellness is an ongoing process which requires daily decisions made by you in the areas of:
 - a. Proper nutrition
 - b. Stress management
 - c. Disease prevention
 - d. Substance abuse control
 - e. Physical fitness

I. Define fitness

1. Physical fitness is defined by the American Medical Association as the general capacity to adapt and respond favorably to physical effort.
2. A physically fit individual is able to perform normal daily activities effectively and have energy remaining for other activities of life (emergencies, leisure or recreational activities, etc.)
3. Physical fitness can be divided into two categories of physiological ingredients.

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- a. Health-related fitness components to include:
 - (1) Strength, dynamic strength (muscular endurance), flexibility, cardiovascular endurance and body composition.

- b. Performance or skill-related fitness components, including:
 - (1) Coordination
 - (2) Agility
 - (3) Power
 - (4) Balance
 - (5) Speed
 - (6) Accuracy

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

SUMMARY AND REVIEW

A. State Lesson Objectives

Turn to cover page for objectives.

B. Review Major Teaching Points

Briefly summarize.

APPLICATION

None.

EVALUATION

None.

ASSIGNMENT

None.

LESSON PLAN

March 2005

COURSE TITLE: Physical Training
Instructor Training Course,
P-9E-11238

TERMINAL OBJECTIVE:
Completely supported by this lesson topic:

CLASSIFICATION: Unclassified

LESSON PLAN NUMBER: 1.2

LESSON TOPIC: Operational Risk Management

ALLOTTED LESSON TIME: 1.0 Classroom

1.0 Upon completion of this unit of instruction the Physical Training Instructor Under Training will demonstrate knowledge to instruct, demonstrate, and facilitate students in the NAVAVSCOLSCOM Physical Training Instructor (PTI) Course curriculum without injury to personnel or damage to equipment.

INSTRUCTIONAL SUPPORT:

1 Classroom Instructor

INSTRUCTIONAL REFERENCES:

1. OPNAVINST 3500.39
2. MCO 3500.27

INSTRUCTIONAL AIDS:

1. PowerPoint Presentation
2. Student Guide
3. Risk Assessment Matrix

ENABLING OBJECTIVES:

Completely supported by this lesson topic:

1.11 Explain principles that apply to Operational Risk Management.

CRITERION TEST:

None

HOMEWORK:

None

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

INTRODUCTION

A. Establish Contact

Display name and lesson topic.

1. Introduce self; give rank, current job.
2. State background, schools, duty stations, etc.
3. State question and answer policy.

B. State Lesson Objectives

Turn to cover page of Lesson Plan and paraphrase objectives.

C. Establish Readiness

1. Motivating Statements
2. Lesson overview
 - a. Lesson Topic: Operational Risk Management
 - b. Major Teaching Points:
 - (1) ORM Terms
 - (2) 5-Step ORM Process
 - (3) Causes of Risk
 - (4) ORM Principles
 - (5) 3 Levels of ORM
 - (6) Use of Risk Assessment Matrix
 - (7) Benefits of ORM

State how and why students need to know the lesson material.

DISCUSSION POINT

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PRESENTATION

A. Operational Risk Management is the process of dealing with risk associated with military operations, which includes risk assessment, risk decision making, and implementation of effective risk controls. It is a decision making tool which increases the ability to make informed decisions and reduces risks to acceptable levels. The goal of ORM is to optimize operational capability and readiness by managing risk to accomplish the mission with minimal loss.

Explain ORM importance to physical training evolutions

B. ORM Terms

1. Hazard:

A condition with the potential to cause personal injury or death, property damage, or mission degradation.

a. Examples: weather, terrain, person's health/sickness are potential hazards.

2. Risk:

An expression of possible loss in terms of severity (how bad) and probability (how often).

a. Examples: If the obstacle course is wet there is a higher risk that an injury from slipping will occur, if is dry, the risk of injury is less. The risk of injury running on a track vice running on a chip trail vice running the sea wall varies. There is less risk running

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during daylight hours vice running at night.

3. Severity:

The worst credible consequence which can occur as a result of a hazard.

- a. Examples: Death is most severe from hazards such as bad medical history or weather conditions (lightning strike, heat stroke/hypothermia). A broken limb is one of the worst credible consequences from a hazard such as uneven terrain, slipping/falling during obstacle course.

4. Probability:

The likelihood that a hazard will result in a mishap or loss.

- a. Examples: The probability of heat stress injury is higher during red flag vs. green flag conditions. The probability of a lightning strike is higher during Thunderstorm Condition I than Thunderstorm Condition III.

5. Risk Assessment

The process of detecting hazards and assessing associated risks.

6. Control:

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A method of reducing risk for an identified hazard by lowering the probability of occurrence, decreasing potential severity, or both.

- a. Examples: Develop a premishap plan, ensure instructors are qualified, utilize medical screening forms, allow ample water breaks to ensure hydration of students, wipe down obstacles (O'course) if wet, and periodically checking chip trail to remove trip hazards.

C. ORM Process

- 1. Identify hazards
- 2. Assess hazards
- 3. Make risk decisions
- 4. Implement controls
- 5. Supervise - evaluation of controls, monitor, and change if necessary.

D. Causes of Risk

- 1. Change (the "mother" of risk)
- 2. Resource constraints
- 3. New technology
- 4. Complexity
- 5. Stress
- 6. Societal constraints
- 7. Environmental influences
- 8. Human nature
- 9. Speed/Tempo of Operation
- 10. High energy levels

E. Four ORM Principles

DISCUSSION POINT

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1. Accept risk when benefits outweigh the cost.
2. Accept no unnecessary risk.
3. Anticipate and manage risk by planning.
4. Make risk decisions at the right level.

F. ORM Levels of Application

1. Time-critical:

On the run consideration of the 5 steps. Entails a quick mental review or discussion using the five steps during the execution phase of operations/training and for crisis response planning.

- a. Examples - PT evolutions as they occur, sudden change in plans, decision must be made without time to consult others.

2. Deliberate:

Application of the complete 5-step process. Slightly expanded, more detailed application of the five steps in planning for an operation or reviewing procedures. This process level is used when there is a good understanding of the issues based on experience.

- a. Examples - Planning the PRT.

3. In-depth:

Complete 5-step process with detailed analysis. Basically the same as deliberate but with a more

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thorough risk assessment (first two steps). It is used to more thoroughly explore the hazards and their associated risk in a complex operation or system, or one in which the hazards are not well understood. A process involving statistics or numerous complicated steps.

- a. Example - planning a water o'course entails much more planning than planning a PRT.

G. Risk Assessment Matrix. When conducting a risk assessment, you must factor in the severity of the hazard, the probability of occurrence, and assign a risk assessment code to determine the risk level. You must then determine what level of risk is acceptable for the activity.

Pass out risk assessment matrix (Optional) - or direct them to Student Guide Matrix)

- a. Severity is broken down into four categories:
 - 1. Category I - The hazard may cause death, loss of facility/asset or result in grave damage to national interests.
 - 2. Category II - The hazard may cause severe injury, illness, property damage, damages to national or service interests or degradation to efficient use of assets.
 - 3. Category III - The hazard may cause minor injury, illness, property damage, damage to national, service or command interests or degradation to efficient use of assets.

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4. Category IV - The hazard presents a minimal threat to personnel safety or health, property, national, service or command interests or efficient use of assets.
- b. Probability of occurrence is broken down into four categories:
1. Sub category A - Likely to occur immediately or within a short period of time. Expected to occur frequently to an individual item or person or continuously to a fleet, inventory or group.
 2. Sub category B - Probably will occur in time. Expected to occur several times to an individual item or person or frequently to a fleet, inventory or group.
 3. Sub category C - May occur in time. Can reasonably be expected to occur some time to an individual item or person or several times to a fleet, inventory or group.
 4. Sub category D - Unlikely to occur.
- c. Risk Assessment Code (RAC) - is an expression of risk which combines the elements of hazard severity and mishap probability. Using the matrix, the RAC is expressed as a single number that can be used to help determine hazard abatement priorities. In some cases, the worst credible consequence of a hazard may not correspond to the highest RAC for that hazard. One hazard may have two potential consequences. The severity of the worst consequence may be unlikely, resulting in a lower RAC.

Using risk assessment matrix, instructor and class conduct mock assessment of O'course, using only two-three hazards.

DISCUSSION POINT

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H. ORM vs. Non-standard Approach

1. Systematic vs. Random, Individual-Dependent
2. Proactive vs. Reactive
3. Integrates all types of risk into plan vs. Safety as after-thought once plan is done
4. Common process terms vs. Non-standard
5. Conscious decision based on risk and benefit vs. "Can Do" regardless of risk.

I. Benefits of ORM

1. Reduction in mishaps
2. Improved mission effectiveness

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

SUMMARY AND REVIEW

A. State Lesson Objectives

Turn to cover page for objectives.

B. Review Major Teaching Points

Briefly summarize.

APPLICATION

None.

EVALUATION

None.

ASSIGNMENT

None.

LESSON PLAN

JANUARY 2005

COURSE TITLE: Physical Training Instructor
Training Course,P-9E-1238

TERMINAL OBJECTIVE:
Completely supported by this lesson topic:

CLASSIFICATION: Unclassified

LESSON PLAN NUMBER: 1.3

LESSON TOPIC: Sports Psychology

ALLOTTED LESSON TIME: 1.0 Classroom

INSTRUCTIONAL SUPPORT:

1 Classroom Instructor

INSTRUCTIONAL REFERENCES:

1. Research conducted by MR. John Kaufman
12/99

INSTRUCTIONAL AIDS:

1. PowerPoint Presentation
2. Student Guide

1.0 Upon completion of this unit of instruction, the Physical Training Instructor Under Training will demonstrate knowledge to instruct, demonstrate, and facilitate students in the NAVAVSCOLSCOM Physical Training Instructor (PTI) Course curriculum without injury to personnel or damage to equipment.

ENABLING OBJECTIVES:

Completely supported by this lesson topic:

- 1.12 Explain how to mentally prepare for improved physical performance.

CRITERION TEST:

None

HOMEWORK:

None

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

INTRODUCTION

A. Establish Contact

Display name and lesson topic.

1. Introduce self; give rank, current job.
2. State background, schools, duty stations, etc.
3. State question and answer policy.

B. State Lesson Objectives

Turn to cover page of Lesson Plan and paraphrase objectives.

C. Establish Readiness

1. Motivating Statements - Strengthen the Mind to Improve Physical Performance "I always felt my greatest asset was not my physical ability. It was my mental ability." This quote by Bruce Jenner, Olympic decathlon gold medallist, epitomizes the importance of being mentally prepared for physical activities. Learning how to "build the mind" can help improve your performance on Navy physical tests.
2. Lesson overview

a. Lesson Topic: Sports Psychology

Briefly outline material to be covered.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

b. Major Teaching Points:

- (1) Goal Setting
- (2) Psychocybernetic Imagery
- (3) "Psyching" Up
- (4) Concentration/Distracton Avoidance
- (5) Mental "Toughness"
- (6) Confidence Building

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

PRESENTATION:

A. Goal Setting:

1. Work with your instructor to set realistic, obtainable physical goals that build up to your final goal. Write your goals down, memorize them, state them out loud and constantly review them. The human mind responds favorably to success. Achieving modest goals on the way to the top provides the mind with a "stair-step to success" as you achieve each goal on your journey to your final achievement goal.

Ask student to state some "stair-step" goals toward their final achievement goal.

B. Psychocybernetic Imagery

1. Most successful athletes have a vivid mental picture of every detail of what they are doing during their physical performance. For instance the professional golfer has thorough awareness of every detail of his golf swing while competing. Most professional athletes develop a mental picture of their physical performance before competition and "practice" by constantly rehearsing this image over and over in their mind; scrutinizing each detail until the image is perfect. Developing a perfect picture and rehearsing it repeatedly can trigger your brain to perform the skills correctly while engaged in the physical activity.

Assist students in developing a mental image of their physical test.

DISCUSSION POINT

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C. "Pysching Up"

1. Arousing the brain can improve physical performance. Karate experts practice the "Kiyai" yell as a way to release adrenaline, a chemical substance produced by the brain that enhances strength and physical performance. Motivational music, singing cadences, HOO YAH's, talking about your physical event and rehearsing psycocybernetic mental images are ways you can "psyche up" before and during your next physical test. "Psyche up" immediately before and during athletic performance. Don't "psyche up" too early before an event because post adrenaline rush use can make you feel fatigued, and "psyched out".

Coach students to perform a loud abdominal, forceful Karate Kiyai yell or HOO YAH until they experience an "adrenaline rush".

D. Concentration/Distracton Avoidance

1. The inability to concentrate and the loss of concentration can decrease one's performance in a military physical fitness test. Mentally or verbally stating your goals and focusing on your psychocybernetic image during Navy a fitness test are tools to use to stay focused and to avoid distraction.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

E. Mental Toughness

1. Military combat history is filled with stories of soldiers continuing to fight with injuries that normally would be debilitating because of pain and trauma. During combat, because of adrenaline release, extreme concentration, and the ability to overcome distraction, soldiers can endure excruciating pain, or in many instances, feel no pain at all. Psyching up and utilizing techniques to concentrate and avoid distraction can develop this type of mental toughness. Try these techniques the next time you feel normal fatigue pains or begin to become "psyched" out". AS YOU ARE IN THE TRAINING ENVIRONMENT, NOT COMBAT, EXTREME CARE SHOULD BE TAKEN NOT TO USE THESE TECHNIQUES TO IGNORE INJURIES THAT SHOULD BE TREATED BY MEDICAL!

Question students on what pains should not be ignored with mental toughness techniques.

(Rhabdomyolysis)

F. Confidence Building

1. Confidence to perform a skill is developed by being mentally prepared, by practicing and by performing correct build-up training. Follow your instructor's prescribed workouts to practice and perform correct build-up training. Use goal setting, imagery, "psyching up" and mental toughness techniques to prepare your mind for improved physical performance.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

SUMMARY AND REVIEW

A. State Lesson Objectives

Turn to cover page for objectives

B. Review Major Teaching Points

Briefly summarize.

APPLICATION

None.

EVALUATION

None.

ASSIGNMENT

None.

LESSON PLAN

JANUARY 2005

COURSE TITLE: Physical Training
Instructor Training
Course, P-9E-1238

CLASSIFICATION: Unclassified

LESSON PLAN NUMBER: 1.4

LESSON TOPIC: Stress Management &
Suicide Prevention

ALLOTTED LESSON TIME: 1.0 Classroom

INSTRUCTIONAL SUPPORT:

1 Classroom Instructor

INSTRUCTIONAL REFERENCES:

1. NAVAVSCOLSCOMINST 1720.1, Naval Aviation Schools Command (NAVAVSCOLSCOM) Program for Suicide Prevention
2. Command Fitness Coordinator Exercise Leader Handbook

INSTRUCTIONAL AIDS:

1. PowerPoint Presentation
2. Student Guide
3. Stress Inventory Form

TERMINAL OBJECTIVE:

Completely supported by this lesson topic:

- 1.0 Upon completion of this unit of instruction the Physical Training Instructor Under Training will demonstrate knowledge to instruct, demonstrate, and facilitate students in the NAVAVSCOLSCOM Physical Training Instructor (PTI) Course curriculum without injury to personnel or damage to equipment.

ENABLING OBJECTIVES:

Completely supported by this lesson topic:

- 1.13 Define stress and suicide.
- 1.14 Identify five sources of stress.
- 1.15 List the detrimental effects of over-stress, including substance abuse.
- 1.16 Discuss the stress management strategies of coping, cooperation, and changing.

CRITERION TEST:

None

HOMEWORK:

None

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

INTRODUCTION:

A. Establish Contact

Display name and lesson topic.

1. Introduce self, give rank, current job.
2. State background, schools, duty stations, etc.
3. State question and answer policy.

B. State Lesson Objectives

Turn to cover page of Lesson Plan and paraphrase objectives.

C. Establish Readiness

1. Motivating Statements

It is essential that you have a basic understanding of the effects of stress and the principles of stress management. Leaders must be able to successfully deal with stress personally and be able to assist others.

Emphasize the importance of understanding the effects of stress on ourselves and of successfully dealing with stress. Emphasize the necessity of suicide prevention.

2. Lesson Overview

Briefly outline material to be covered.

a. Lesson Topic: Stress Management/Suicide Prevention

b. Major Teaching Points:

(1) Sources of Stress

DISCUSSION POINT

- (2) Symptoms and Detrimental Effects
- (3) Managing Stress
- (4) Suicide Prevention

RELATED INSTRUCTOR ACTIVITY

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

PRESENTATION:

A. Sources of Stress

1. Stress can be defined as the body's and the mind's reaction to the demands, whether real or perceived, of the environment. Stress may result from many sources.
2. People have different reactions to the same stress. What is stressful for one person may not be stressful for another. Not all stress, is harmful; some stress can be beneficial up to a point. If stress becomes too intense, prolonged, or frustrating it can become physically or emotionally harmful.
3. Stress unchecked can lead to suicide.
4. The changing nature of the work environment and major life changes cause individuals to behave differently. For personnel in positions of authority and responsibility, the workplace itself can be a source of stress. You must remain alert for signs of over-stress in your subordinates and yourself. Five examples of stressors most commonly experienced by Naval personnel are:

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- a. Decision Making
- b. Performance Expectations
- c. Workload/Environment
- d. Personal Demands
- e. Changing Life Situations

B. Symptoms and Detrimental Effects

1. The first step in handling stress is identifying what stresses exist in our lives. Once we have identified these stresses we can begin to establish and implement successful strategies. Some stress is good because it can show us when we need to take action. Knowing the early warning signs, symptoms, and detrimental effects allow us to properly deal with stress. Some of the more common and obvious signs of inappropriate stress management are:
 - a. Alcohol or drug abuse.
 - b. Denial, withdrawal, or isolation.
 - c. Impulsive or "out of character" behavior.
 - d. Improper diet.
 - e. Aggression.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- f. Anxiety.
- g. Low productivity and quality of performance.
- h. Health Problems.
- i. Absenteeism.
- j. Irritability

Health problems: Indigestion, Diarrhea, Cramping and Headache, are just to name a few.

C. Managing Stress

- 1. Military personnel need to know the strategies to manage stress. There are three basic strategies for managing stress: coping, cooperating, and changing.
 - a. Coping strategies: Each person has several ways to deal with stress. Each of these stress self-management techniques can be called a "stress buffer". They provide the added strength each of us need in the face of adversity. A keen sense of self-awareness lets us know when to use these stress buffers.
 - (1) Nutritious diet.
 - (2) Regular vigorous exercise.
 - (3) Self-awareness (Recognize Stress).

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (4) Time management.
- (5) Take up hobbies (Reading, fishing, gardening, Sports etc...)
- b. Cooperating strategies: Support systems are critical for handling stress. We all need places where we can go to be listened to and understood. Problems seem easier to handle when others are allowed to help. Here are some possible support groups:
 - (1) Family/Friends
 - (2) Supervisors/Peers
 - (3) Chaplain
 - (4) Flight Surgeon/Appropriate Medical Personnel
 - (5) Social groups/Family Service Center
- c. Changing strategies: You can reduce stress by making small lifestyle changes such as:
 - (1) Set realistic goals
 - (2) Relax more
 - (3) Use hobbies as a change
 - (4) Reduce alcohol intake

Refer to Supervisor's Guide to Suicide Prevention Handout

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

2. Stress in and of itself is not bad. It can, however, be very damaging if not controlled and regulated. We all continually deal with stress in our daily living. We should also be aware that there are effective ways to keep it under control. As individuals we must recognize potential problems within ourselves and others and know how and where to gain assistance.

D. Suicide Prevention

1. The following information is designed to give you a basic understanding of suicide, its misconceptions, danger signs, and where to get help. The advice and expert knowledge of a qualified professional are needed whenever there is a serious risk of suicide. Suicide is the Navy's third leading cause of death, first two causes are Motor Vehicle Accidents and Heart Disease.

Definitions:

- a. Suicide is self-induced death, intentionally caused.
- b. A suicide attempt is an intentional act, causing physical self-harm, where death would have occurred had there been no intervention.
- c. A suicide gesture is an intentional act, causing or intending to cause physical self-harm in a way normally associated with suicide, but which would not have

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

caused death, even without intervention.

- d. Suicide ideation is a statement or pattern of statements, words, or behaviors, which reveal a preoccupation with the idea of self-induced death.

2. Suicide Causes/Facts:

- a. Relationships and/or family problems.
- b. Depression
- c. Job
- d. Poor Self esteem
- e. Health
- f. Stress
- g. Finances
- h. Loss of Hope
- i. Suicide is the third leading cause of death after motor vehicle accident and heart disease for Naval personnel.
- j. Military rates slightly higher than national rates.
- k. The majority of suicidal personnel project clues or warnings of intentions.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

3. Suicide risk factors. The risk of suicide is higher among individuals who have:
 - a. Problems with family, relationships, depression, job, Navy, and/or finances.
 - b. Made previous attempts.
 - c. A family history of suicide.
 - d. Experienced a recent suicide of friend or relative.
 - e. Threaten suicide.
 - f. Possession of a weapon.
 - g. Specific, well thought out plans.
4. Suicide Warning Signs - You should take preventative actions if you observe any indication of suicide. Here are the most common warning signs:
 - a. A verbal statement of a wish to die or a direct threat of self-harm.
 - b. An unusual interest in or talk about the subject of death. This can be through speech, art, letters, etc...
 - c. Talk about feelings of worthlessness.
 - d. A decline in job performance and/or personal appearance.

DISCUSSION POINT

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- e. Changes in sleep patterns or appetite.
 - f. Unusual withdrawal, isolation, aggression, disinterests, moodiness, or crying spells.
 - g. Making final arrangements, giving away favorite possessions, writing a will.
 - h. Becoming accident-prone.
 - i. Depression over the recent death of friend or relative.
 - j. Marked changes in behavior or personality.
5. Suicide Myths - People believe many misconceptions about suicide. Some of the more common myths are:
- a. Only certain types of people commit suicide.
 - b. People who threaten suicide don't commit suicide.
 - c. People who have been unsuccessful are not serious about committing suicide.
 - d. Suicide will never happen to anyone you know.
6. Individuals role in suicide prevention - You must be prepared to take quick and positive action to prevent suicide. Here are some

Refer to Stats by Paygrade
Transparency

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

specific techniques:

- a. Know your personnel/peers. Be alert for indications of threatened suicidal behavior or suicidal ideation in subordinates and peers. If either is detected, take immediate action, as suicidal behavior is a medical emergency.
- b. Be active and concerned. Demonstrate an interest in the people around you. WATCH! LISTEN! REPORT!
- c. Be aware of resources available to assist you in helping others.
- d. Know the suicide warning signs and risk factors.
- e. Know what to do if you discover someone attempting or threatening suicide:
 - (1) Remain calm.
 - (2) Call for professional help.
 - (3) Do not leave the individual alone.
 - (4) Escort members with suspected suicidal behavior to the nearest military medical facility.
 - (5) Report incident to Command Duty Officer (CDO).

DISCUSSION POINT

(6) Report incident to Command Chaplain for follow-up.

(7) Be familiar with command SOP for handling suicide incidents.

f. Monitor yourself. Have the courage to seek help.

Suicide can be prevented. It is an ALL HANDS responsibility.

RELATED INSTRUCTOR ACTIVITY

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

SUMMARY AND REVIEW

A. State Lesson Objectives

Turn to cover page for objectives.

B. Review Major Teaching Points

Briefly summarize.

APPLICATION

None.

EVALUATION

None.

ASSIGNMENT

None.

LESSON PLAN

JANUARY 2005

COURSE TITLE: Physical Training
Instructor Training
Course, P-9E-1238

CLASSIFICATION: Unclassified

LESSON TOPIC NUMBER: 1.5

LESSON TOPIC: Beneficial Stretches
Non-Beneficial Exercises
and Stretches

ALLOTTED LESSON TIME: 1.0 Classroom
1.0 Lab

INSTRUCTIONAL SUPPORT:

- 1 Classroom Instructor
- 1 Laboratory Instructor
- 1 Assistant Instructor

INSTRUCTIONAL REFERENCES:

- 1. Naval Special Warfare Calisthenics:
Sports Medicine Conference Summary

INSTRUCTIONAL AIDS:

- 1. PowerPoint Presentation
- 2. Naval Special Warfare Calisthenics:
Sports Medicine Conference Summary
Handout

TERMINAL OBJECTIVE:

Partially supported by this lesson topic:

- 1.0 Upon completion of this unit of instruction the Physical Training Instructor Under Training will demonstrate knowledge to instruct, demonstrate, and facilitate students in the NAVAVSCOLSCOM Physical Training Instructor (PTI) Course curriculum without injury to personnel or damage to equipment.

ENABLING OBJECTIVES:

Completely supported by this lesson topic:

- 1.17 Identify stretching principles
- 1.18 Identify non-beneficial exercises for physical fitness
- 1.19 Perform beneficial stretches

CRITERION TEST: None

HOMEWORK: None

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

INTRODUCTION

A. Establish Contact

Display name and lesson topic.

1. Introduce self give rank, current job.

2. State background, schools, duty stations, etc.

3. State question and answer policy.

B. State Lesson Objectives

Turn to cover page of lesson plan and paraphrase objectives.

C. Establish Readiness

1. Motivating statements

In preparation to be a Physical Training Instructor, you must become knowledgeable of beneficial and non-beneficial or unsafe exercises.

Establish importance and relevance of lesson material using personal experience or anecdote.

2. Lesson overview

Briefly outline material to be covered.

a. Lesson Topic: Exercises

b. Major Teaching Points:

(1) Stretching principles

(2) Beneficial stretches

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

(3) Non-beneficial exercises/stretchches

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

PRESENTATION

A. Stretching Principles

1. The body responds to a sustained stretch (greater than 15 seconds).
2. Go to the point of a slight stretch discomfort, not a painful stretch. DO NOT BOUNCE. Try to relax when stretching.
3. Prior to stretching do general conditioning exercise such as jump jacks/side straddle hops to warm up the muscles and "Get the blood flowing." At minimum give those muscles that will be stressed during the exercise a comprehensive warm-up and stretch.

B. Perform Beneficial Stretches and incorporate PNF techniques.

1. Proprioceptive Neuromuscular Facilitation (PNF) Stretching is where the body part is stretched, followed by an isometric contraction and then followed by a sustained stretch. PNF is considered an advanced stretching technique. When a muscle is slowly stretched and held, the resulting tension triggers the lengthening reaction, which prevents the stretched muscle fibers from contracting.
 - a. A common PNF technique is referred to as the contract-relax method.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (1) Passive stretch for 15 seconds.
 - (2) Isometric contraction for 7-15 seconds.
 - (3) Relax.
 - (4) Passive stretch to new end Rate of Movement (ROM).
2. Back Benders
 - a. Primary Benefit To (PBT) the hamstrings, hip and thigh adductor.
 - b. Instruct student to keep the back straight to prevent low back injuries. Sit and bend at waist.
 3. Buds/Knee (Iliotibial Band Stretch)
 - a. PBT, Iliotibial band. This is an excellent stretch to prevent injury to the ITB, common for a runner's injury.
 - b. Description: Perform while seated, with one leg extended in front of hips, and the other leg crossed over the extended leg at the knee. Turn the upper torso toward the bent leg stretching the iliotibial band of that leg. Use the elbow on the side of the straight leg to hold the stretch.
 4. Chest Stretch

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- a. PBT; Chest and anterior shoulder muscles
 - b. Description: Begin from a standing position with arms extended to the side at shoulder level. While keeping the thumbs pointed up, extend the arms backward. Either have another person hold the stretch or use a pole for resistance
5. Swimmer's Stretch
- a. PBT; Chest and anterior shoulder muscles
 - b. Description: Perform this exercise either seated or standing without bending over. This stretch should be performed with thumbs pointing downward throughout the stretch. Clasp hands together behind the lower back, and slowly pull the arms up and toward the head.
6. Groin Stretcher/Butterflies
- a. PBT, leg adductor
 - b. Description: Begin by sitting with legs bent and the bottoms of the feet together. Grasp the ankles and push the legs to the floor using the elbows while bending the upper torso toward the feet.
 - c. Butterflies, keep the back straight and grab the ankles not the toes.
7. Groin Stretch

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- | | |
|--|--|
| <ul style="list-style-type: none">a. PBT; Leg adductorsb. Description: Begin standing, with legs far enough apart to allow for sufficient stretch and toes pointed slightly outward. Shift body weight to one side while bending the leg on that side. The stretch should be felt on the inner aspect of the thigh of the straight leg. <p>8. Inside Hurdlers Stretch (Hamstrings)</p> <ul style="list-style-type: none">a. PBT; Hamstringsb. Description: From the sitting position, extend one leg out straight in front of hips while tucking the other leg in front of the hips with the knee pointing outward. Bend the torso forward toward the knee of the extended leg, stretching the muscles in the back of the leg. Reach with the same hand to same foot. <p>9. Seated head to knee (sitting)</p> <ul style="list-style-type: none">a. PBT; leg flexorsb. Description: From the sitting position, extend the legs forward and bend the torso toward the knees, maintain a <u>slight bend</u> in the knees, stretching the back of the legs. <p>10. Single Leg Hamstring</p> | <p>The bent knee should always be aligned over the heel. Never exceed 90 degree.</p> |
|--|--|

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- a. PBT; leg flexors
 - b. Description: From the sitting position, bring one knee up to the chest and extend the leg. Hold the stretch by grasping behind the knee. Keep back flat throughout the stretch.
11. Gastrocnemius/Soleus Stretch
- a. PBT; Gastrocnemius/Soleus
 - b. An excellent pre-running/walking exercise
 - c. Description: Standing away from the wall step back with one foot. Press hips forward slightly bending the forward knee and raising the back heel off the ground. Flex the foot stretching the calf muscles. Keep the leg of the stretched muscle straight.
12. Rotator Cuff
- a. PBT; Shoulder (posterior deltoid)
 - b. Description: Bring the arm that is to be stretched across the chest. Use the opposite arm to pull the arm being stretched towards the chest until the stretch is felt in the posterior shoulder.
13. Trunk Side to Side
- a. PBT; Abdominal

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- b. Description: Standing straight, arms either above the head or straight to the sides, bent the torso to the side and hold. Return to starting position and repeat to the other side.

14. Tricep Stretch

- a. PBT; Triceps
- b. Description: Standing erect, bring the arm to be stretched up and back so that the elbow is pointing toward the sky and the hand rests between the shoulder blades. Gently pull the arm toward the midline behind the head to stretch the tricep muscle.

15. Trunk Twisters

- a. PBT; abdominals
- b. It should be performed from a seated position (instead of standing) to avoid placing stress on the knee.
- c. Description: Starting from the seated position with hands behind the head, twist the upper torso to one side, and then to the other.

16. Cherry Pickers (Seated)

- a. PBT; Hamstrings

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- b. Description: Begin from a seated position with legs extended out and to the side as far as possible, gently bend at the waist to the right, then left, then center for 15 seconds and relax.

17. Lower Back Stretch

- a. PBT; lower back
- b. Description: While lying on back (supine), bring one knee up and toward the chest. Place the hands behind the knee and gently pull leg toward the chest, stretching the back muscles.

18. Supine Back Stretch

- a. PBT; lower back
- b. Description: While lying on back (supine), bring both knees up; and toward the chest. Place the hands behind the knees and gently pull both legs toward the chest, stretching the back muscles.

19. Quadricep Stretch

- a. PBT; Quadricep
- b. Description: From the prone or standing position, bend one leg back toward the buttocks stretching the front of the bent leg. Use the hand on the same side as the

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

bent leg to hold the stretch. Knees should be kept parallel and together. Can be performed from the standing position.

20. Abdominal Stretch

- a. PBT; abdominal
- b. Description: Begin lying on stomach (prone) with hands flat on the deck as for a push-up. Extend the arms so that the upper torso lifts off the deck.

21. Achilles Stretch

- a. PBT; Achilles tendon
- b. Description: Start from the standing position, step forward bending slightly at both knees allowing the back heel to come off the ground approximately 1 inch. Lean slightly back and press downward with the back heel stretching the achilles tendon.

22. Iliopsoas Stretch

- a. PBT; iliopsoas muscle
- b. Description: Begin from a standing position. Step forward with one leg, placing one foot in front of the other. Keep both legs slightly bent. Weight should be distributed toward the front foot. Flatten the back and tuck the hips under, stretching the iliopsoas muscle on the front of the back

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

leg.

23. Hip Stretch

- a. PBT; hip extensors
- b. Description: Begin lying with back on the deck, knees bent, and feet flat on the deck. Cross one leg so that the ankle is resting on the knee of the other leg. Slowly lift the one leg off the deck and move it toward the chest. Stretch should be felt in the hip of the crossed leg.

24. Penguin Walk

- a. PBT; gastrocnemius and conditioning exercise for the anterior tibialis
- b. While standing with the weight over the heels, flex feet and toes upward, stretching the calf muscles. Maintain this position and walk on the heels.

D. Non-Beneficial Exercises / Stretches

These exercises do provide aerobic or anaerobic conditioning however the risk of injury is high.

1. Plyometric Star Jumps

- a. This exercise puts a large shearing force on the knee because the starting position for the knees is at a position greater than 90 degrees flexion.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

2. Standing Calf Stretch
 - a. Potential for injury to the back.
 - b. Description: In the standing position bend over grab toes and pull up.
3. Mountain Climbers
 - a. Knees are flexed greater than 90 degrees and absorbing force.
4. Cross-Overs (standing hamstring)
 - a. Potential for low back injury.
5. Two and Four count Windmills
 - a. Bending over at the waist with knees straight increases spinal disc pressure by 400 percent.
6. Cherry Pickers (Standing)
 - a. Ballistic tretches (bouncing) are counter productive; bending over at the waist with the legs straight increases spinal disk pressure.
7. Thigh Stretch (2 person)
 - a. Over pressure on the leg increases the likelihood for injury to the knee.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

8. Lat Pull Down (behind neck)
 - a. Perform pull downs in front to top of chest
9. Back Stretch (yoga plow)
 - a. Potential injury to the spine.
10. Hand to Toe Sit-Ups (straight leg)
 - a. Places mechanical stress on the back.
11. Standing Head to Knee
 - a. Potential for injury to the discs and lower back. Bending over statically at the waist increases spinal disc pressure by 400%.
12. Inverted Cycling
 - a. May compress cervical (neck region) vertebrae
13. Mountain Climbers
 - a. Increases injury to knee

Bend over at the waist and grab behind the calfs.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

SUMMARY AND REVIEW

A. State Lesson Objectives

Turn to cover page for objectives.

B. Review Major Teaching Points

Briefly summarize.

APPLICATION

None.

EVALUATION

None.

ASSIGNMENT

None.

LESSON PLAN

JANUARY 2005

COURSE TITLE: Physical Training
Instructor Training Course,
P-9E-1238

CLASSIFICATION: Unclassified

LESSON TOPIC NUMBER: 1.6

LESSON TOPIC: Major Components of the
Musculoskeletal System

ALLOTTED LESSON TIME: 1.5 Classroom

INSTRUCTIONAL SUPPORT:

1 Classroom Instructor

INSTRUCTIONAL REFERENCES:

1. Cooper Institute
2. New Fitness Coordinator Exercise
Leader Handbook
3. Biomechanically Correct, Everet Aaberg

INSTRUCTIONAL AIDS:

1. PowerPoint Presentation
2. Student Guide
3. VCR
4. The New Living body "Bones and Joints"
video
5. Human Skeleton Model
6. Joint Models

TERMINAL OBJECTIVE:
Partially supported by this lesson topic:

- 1.0 Upon completion of this unit of instruction the Physical Training Instructor Under Training will demonstrate knowledge to instruct, demonstrate, and facilitate students in the NAVAVSCOLSCOM Physical Training Instructor (PTI) Course curriculum without injury to personnel or damage to equipment.

ENABLING OBJECTIVES:

Completely supported by this lesson topic:

- 1.20 Identify major components of the musculoskeletal system and their function.
- 1.21 Identify types of muscle movement.

CRITERION TEST:

None

HOMEWORK:

None

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

INTRODUCTION

A. Establish Contact

Display name and lesson topic.

1. Introduce self, give rank, current job.

2. State background, schools, duty stations, etc.

3. State question and answer policy.

B. State Lesson Objectives

Turn to cover page of lesson plan and paraphrase objectives.

C. Establish Readiness

1. Motivating statements

In preparation to be a physical training instructor, you must have a basic knowledge of the musculoskeletal system, so injuries can be reduced.

Establish importance and relevance of lesson using personal experience or anecdote.

2. Lesson overview

Briefly outline material to be covered.

a. Lesson Topic: Major Components of the Musculoskeletal System

b. Major Teaching Points:

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (1) Explain major components of the musculoskeletal system.
- (2) Describe the types and purpose of connective tissue.
- (3) Identify types of muscle fibers.
- (4) Identify types of movement.
- (5) Identify major muscle groups.
- (6) Describe muscle operating principles.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

PRESENTATION

A. Major Components of the Musculoskeletal System

1. Human Musculoskeletal System is divided into four components: bones, joints, connective tissues, and muscles.
 - a. Each system is interdependent upon the others to produce movement.
2. Four major functions of the musculoskeletal system:
 - a. Gives form to the body
 - b. Supports the body
 - c. Provides the basis for locomotion or movement
 - d. Protects the following major body organs:
 - (1) Brain (skull)
 - (2) Heart and lungs (ribcage)
 - (3) Pelvic organs (pelvic bone)
 - (4) Spinal cord (vertebrae)
3. Bones

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- a. Composed of a hard outer shell encasing harder compact tissue, and an inner spongy, porous portion called cancellous tissue.
- b. Arterys, nerves, veins, and marrow are present in the cancellous tissue.
- c. Bones are composed of calcium, phosphorous, other mineral salts, and ossein (an organic substance).
 - (1) Calcium deficiency, osteoporosis, causes brittle bones. The body takes calcium from the bones to make up for any deficiency in the body.
- d. 206 bones in the human body make up the skeleton.
 - (1) Axial skeleton. 80 bones of head, neck, and trunk. Primary function is to provide support and stabilization.
 - (2) Appendicular skeleton is composed of 126 bones that form the shoulders, pelvis, arms, legs, hands, and feet. The primary function is performing movement.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

4. Joints

- a. Point where two bones connect.
- b. There are three types of joints. The type of joint is based upon the amount of movement performed by the joint.
 - (1) Fibrous (immovable joints) such as those found in the skull.
 - (2) Cartilaginous (slightly moveable) joints such as those found in the vertebral column and the ribs.
 - (3) Synovial joints (free movable joints) can be broken down into three types.
 - (a) Uniaxial. Movement in one direction/axis only. Examples are elbow, knee.
 - (b) Biaxial. Movement in two directions/axis. Examples are the wrist and ankles.
 - (c) Multiaxial. Movement in at least three directions/axis. Examples are the shoulder and hip.

5. Connective Tissues

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- a. Ligaments are slightly elastic bands of white fibrous tissue, and connect bone to bone at the joint.
- b. Tendons are extensions of muscle fibers, that are more elastic than ligaments and attach muscle to bone.
- c. Bursa are fluid filled pads that act as shock absorbers and provide a smoother surface for tendons to move over bones.
- d. Cartilage is a firm, elastic flexible material found at the end of ribs, between vertebrae and at joint surfaces.

6. Muscles

- a. There are three types of muscle tissue.
 - (1) Involuntary/smooth muscles are not under conscious control and handle the work of the internal organs except the heart.
 - (2) Voluntary/skeletal muscles are under conscious control, arms, legs, hips, chest, back. Skeletal muscles are attached to the bones directly or by tendons.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (3) Cardiac/heart muscle.
- b. A muscle is 75% water and 20% protein and 5% is a combination of inorganic salts and other substances.
 - c. Muscles contain two sliding protein filaments, actin and myosin. When stimulated by the central nervous system and fueled by Adenosine Triphosphate (ATP), these filaments pull together, causing the muscle to contract.
 - d. Muscles contain two types of fibers. The body may use one or a combination of both fibers for physical activity depending upon the level of intensity. The number and type of fibers is hereditary. The proportion or distribution of these fiber types within and across individuals differs. Also, within an individual, the distribution of fibers in various muscles can vary widely. Specific types of training can induce changes in muscle fiber characteristics, but only to a certain degree.
- (1) Fast-twitch fibers are broken down into two subcategories:
- (a) Fast Glycogenolytic (FG) fibers are

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

used for high intensity activities such as sprinting and power lifting. They rely largely on the short term glycolytic system for energy (anaerobic energy system) during exercises lasting approximately 10 seconds or less.

- (b) Fast-Oxidative-Glycolytic (FOG) fibers are considered intermediate fibers because they are used for high intensity exercises such as the 400 meter run, 100 meter swim approximately 10-90 seconds in duration. They have a capacity for using both aerobic and anaerobic energy.
- (2) Slow twitch fibers (Slow Oxidative) (SO) are used for lower intensity, endurance, type activities such as long distance running or swimming. They are fatigue resistant and well suited for prolonged aerobic exercise, they have a slow contraction speed and utilize almost exclusively the aerobic energy system.

Instructor refer to chart on powerpoint

7. Movement

- a. Bones provide structural support while the muscles house the energy mechanism for producing movement, the joints and

DISCUSSION POINT

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connective tissues hold the structure together. All musculoskeletal components work together to produce movement.

- b. There are three planes of motion used to describe muscle movement. The neutral or anatomical position is the starting position for these planes. Anatomical is described as standing upright, head facing forward, feet straight ahead and arms hanging by the sides with palms turned forward.
 - (1) Median Plane. Divides the body down the middle into left and right sides.
 - (2) Frontal plane. Divides the body into front (anterior) and back (posterior) halves.
 - (3) Horizontal/Transversal plane. Divides the body into upper and lower halves.

B. Types of muscle contractions

- 1. Isometric. Contraction in a muscle occurs without movement, ie; squeezing one's hands together and the chest contracts.
- 2. Isotonic. Contraction in a muscle occurs with movement at any speed, ie; push-ups-chest contracts while moving up and down. You determine the
 - a. Concentric contraction is the positive movement,

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when the working muscle works against gravity and the working muscle shortens. (i.e., biceps curl - up).

b. Eccentric contraction is the negative movement when the working muscle works with gravity but slower than gravity, the working muscle lengthens.

3. Isokinetic. Contraction in a muscle occurs with movement at a set speed.

C. Types of muscle movement

1. Flexion. Decreases a joint angle. Movement normally occurs in the median plane (parallel) and is any movement that takes a body part forward from the anatomical position. Several exceptions: Lateral Flexion is the side to side movement of neck and trunk and takes place in the frontal plane.) Flexion of the knee is an exception - brings the knee Back from the anatomical position; and dorsi flexion (which is also ankle flexion) brings the foot up towards the shin.

2. Extension. Increases a joint angle. Movement normally occurs parallel to the median plane. Motion that brings a body part backwards from the anatomical position. (Exception is plantar flexion which is also ankle extension, bringing the foot down).

3. Hyper Extension. Movement in a joint beyond the normal range of extension.

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4. Adduction. Movement occurs parallel to the frontal plane. Movement of a body part toward the midline of the body. (Horizontal adduction occurs in horizontal plane).
5. Abduction. Movement occurs parallel to the frontal plane. Movement of a body part away from the midline of the body. (Horizontal abduction occurs in the horizontal plane.)
6. Internal rotation. Movement occurs parallel to the horizontal plane. Rotation of a body part towards the centerline of the body. (Pronation is a similar movement).
7. External rotation. Movement occurs parallel to the horizontal plane. Rotation of a body part away from the centerline of the body. (Supination is a similar movement).
8. Pronation. Movement of the palms inward; internal rotation.
9. Supination. Movement of the palms outward; external rotation.
10. Elevation. Movement to a superior position, lifting.
11. Depression. Movement to a inferior position, lowering.
12. Inversion. The sole of the foot turned in, lifting its

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medial border.

13. Eversion. The sole of the foot turned outward, lifting its lateral border.

D. Properties of Muscle Tissue

1. Excitability. Ability to sense and respond to stimuli. Receives stimulus/message from the brain.
2. Contractibility. Ability to contract or shorten from the resting length.
3. Elasticity. Ability to return to normal resting length "snap back".
4. Extensibility. Ability to be stretched.

E. Roles that Muscles Assume

1. Protagonist. Primary mover (i.e., Biceps Brachii during arm curl).
2. Agonist. Arranged opposite the protagonist (i.e., triceps brachii during arm curl).
3. Stabilizer. Holds a joint in place.
4. Neutralizers. Assist other muscles in performing their roles. Prevent unwanted movement.

F. Major Muscle Groups

DISCUSSION POINT

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Note: Indicated movements where muscle was protagonist, remember that movement almost always involves a group of muscles working together in different capacities and at different stages of the movement, depending upon the complexity of the movement.

1. Pectoralis major and minor (Chest Muscle). Shoulder horizontal adduction. (Dumbbell or barbell chest press, cable adductions, machine press.)
2. Latissimus dorsi. Shoulder adduction, shoulder extension. Cable adduction, lat pulldowns, lat pullups, rows.
3. Biceps Brachii. Elbow joint flexion and supination, (Dumbbell or barbell curls, cable curls, curl-ups, dumbbell supination.
4. Triceps Brachii. Elbow joint extension. (Pushdowns, close grip push-ups or bench press, tricep extensions)
5. Deltoids. There are three different heads of the deltoid. The anterior (front) deltoid is responsible for shoulder flexion (Barbell, machine, or dumbbell front press). The medial deltoid is responsible for shoulder abduction (Lateral or cable raises). The posterior deltoid is responsible for shoulder horizontal abduction (Machine, dumbbell rear delt rows).
6. Rhomboids. Scapula elevation, retraction, and downward

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- rotation. Pullups, front pulldowns, rowing movements.
7. Trapezius. Scapula elevation, depression, and upward rotation. Dumbbell side raises, dumbbell front delt press, Shrugs, rowing or pulling exercises with retraction, pushing or pressing exercises with retraction.
 8. Iliopsoas. Hip joint flexion. (Seated hip flexion, leg lifts, jumping, running)
 9. Quadriceps. There are four different muscles which make up the quadriceps: The rectus femoris, and the vastus medialis, lateralis, and itnermedius. They are responsible for knee joint extension and hip flexion. (Leg extension, seated hip flexion, leg press, squats, lunges, running, jumping.)
 10. Hamstrings. There are three different muscles which make up the hamstrings: the biceps femoris, semitendinosus, and sememembranosus. They are responsible for knee joint flexion and hip extension. (Leg press, squats, lunges, leg flexor, running, jumping.)
 11. Gastrocnemius/Soleus - Ankle plantar flexion. (Calf raises, jumping).
 12. Gluteus Maximus, Medius, and Minimus - Hip joint extension, abduction, internal rotation and external rotation. (Machine hip extension, superman's, cable hip abduction, kicking, isometric or isokinetic

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internal and external rotations.)

DISCUSSION POINT

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SUMMARY AND REVIEW

A. State Lesson Objectives

Turn to cover page for objectives.

B. Review Major Teaching Points

Briefly summarize.

APPLICATION

None.

EVALUATION

None.

ASSIGNMENT

None.

LESSON PLAN

JANUARY 2005

COURSE TITLE: Physical Training
Instructor Training
Course, P-9E-1238

CLASSIFICATION: Unclassified

LESSON TOPIC NUMBER: 1.7

LESSON TOPIC: Principles of Training

ALLOTTED LESSON TIME: 1.5 Classroom

INSTRUCTIONAL SUPPORT:

1 Classroom Instructor

INSTRUCTIONAL REFERENCES:

1. Cooper Institute
2. New Fitness Coordinator Exercise Leader Handbook
3. Naval Special Warfare Calisthenics: Sports Medicine Conference Summary

INSTRUCTIONAL AIDS:

1. PowerPoint Presentation
2. Student Guide
3. The New Living Body "Muscles" video
4. VCR

TERMINAL OBJECTIVE:

Partially supported by this lesson topic:

- 1.0 Upon completion of this unit of instruction the Physical Training Instructor Under Training will demonstrate knowledge to instruct, demonstrate, and facilitate students in the NAVAVSCOLSCOM Physical Training Instructor (PTI) Course curriculum without injury to personnel or damage to equipment.

ENABLING OBJECTIVES:

Completely supported by this lesson topic:

- 1.22 Identify principles of training
- 1.23 Identify physiology of energy utilization

CRITERION TEST:

None

HOMEWORK:

None

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

INTRODUCTION

A. Establish Contact

Display name and lesson topic.

1. Introduce self, give rank, current job.
2. State background, schools, duty stations, etc.
3. State question and answer policy.

B. State Lesson Objectives

Turn to cover page of lesson plan and paraphrase objectives.

C. Establish Readiness

1. Motivating statements

In preparation to be a Physical Training Instructor, you must become confident and knowledgeable of the human body.

Establish importance and relevance of lesson material using personal experience or anecdote.

2. Lesson overview

The purpose of this lesson topic is to introduce the student to the muscles of the human body, fitness program components and the principles of training.

Briefly outline material to be covered.

- a. Lesson Topic: Principles of Training
- b. Major Teaching Points:

DISCUSSION POINT

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- (1) Muscle fitness
- (2) Muscle operating principles
- (3) Principles of training
- (4) Fitness program components
- (5) Strength gains
- (6) Other training considerations
- (7) Physiology of energy utilization

DISCUSSION POINT

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PRESENTATION

A. Muscle fitness

1. Combination of muscular strength and muscular endurance.
 - a. Absolute strength is the ability of the muscle to exert maximal force during a single contraction.
 - b. Dynamic strength is the ability of the muscle to sustain repeated muscular contractions without undue fatigue.
2. Muscle tissue growth is termed hypertrophy.
3. Muscle tissue degeneration is termed atrophy.

B. Muscle Operating Principles

1. The amount of strength you can generate (force output) is determined by the three S's.
 - a. Sex, male or female.
 - b. Size, the larger the muscle, the greater the force output potential. Muscles get larger by hypertrophy, increasing the size of muscle fibers, NOT by increasing the number of fibers, called hyperplasia.
 - c. Selective Recruitment, the brain interprets the action to be performed, then determines

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how many of the muscle fibers will be needed to accomplish the task.

2. All or None Law of Selective Recruitment
 - a. Muscles can contract with varying degrees of force depending upon the requirement of a particular act. CNS is the controller.
 - b. Motor unit = one nerve + muscle fibers
 - c. Brain sends impulse causing a motor unit to fire. All the muscle fibers attached to that nerve will be activated. Every muscle fiber attached to that nerve will contract at 100% of their potential. If the brain interprets the need for more force to be used, more motor units will be activated. All fibers associated with a motor unit contract at 100% of their potential.
 - d. The brain determines the number of motor units necessary for performing each function, depending upon different factors, i.e., complexity of movement, strength required, etc.

C. Principles of Training

1. Overload. Exposing the body to loads greater than which it is accustomed to. You can vary the frequency of the exercise, the intensity of the exercise, the type of exercises, or the time/duration of the exercise. Variation in any one of these is considered overload.

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2. Specificity. The type of adaptation is specific to the type of exercise performed. If you wish to increase upper body muscular endurance, you must perform endurance type exercises for maximal endurance gains.
3. Adaptation. The body adapts by changing structure or function at rest. During exercise your body experiences microscopic tears in the muscle tissue, it also experiences many other physiological stresses. It adapts to these stresses while at rest. Therefore, rest is as important as performing the exercises for positive physiological changes to take place.
4. Progression. Continually applying overload to experience training gains. The safest way to progress is within established guidelines. This will allow the body to adapt positively with less risk of injury.
5. FITT Principle. A system for applying overload thru variation of any one of the principles.
 - a. Frequency (of exercise). How many days per week you perform that particular exercise.
 - b. Intensity (how hard). A good way to measure intensity is to determine the heart rate at which you are training via Karvonen method, heart rate monitor, rate of perceived exertion, etc.
 - c. Time (duration). Amount of time per workout

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you spend performing that particular exercise, i.e., a 60 minute run vice a 20 minute run.

- d. Type (specificity). Training in a mode specific to the adaptations you wish to take place, i.e., you can bicycle to increase your cardiovascular fitness level, however to increase your running speed or distance you must actually run.

6. Training Reversibility

- a. Fitness that is gained from exercise can be lost quickly. It only takes as little as one to four weeks for significant deconditioning to take place.
- b. Some of the major effects of deconditioning are:
 - (1) Decrease in maximal aerobic capacity
 - (2) A more rapid buildup of lactic acid
 - (3) A reduction in levels of enzymes which are responsible for regulation of the muscles ability to generate energy and to buffer lactic acid.
 - (4) Reduced ability to store glycogen in the muscle tissue between workouts.
 - (5) Reduced breathing volume which will decrease the amount of oxygen being taken

DISCUSSION POINT

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to the exercising muscle.

(6) Decreased endurance

(7) Decreased ability to dissipate body heat during exercise or exercise in adverse conditions.

b. Having once been physically fit does not make it any easier to get back into shape.

c. It is better to maintain your current level of fitness than to let it decline and try to

d. Fitness declines quickly but can be maintained with as few as two workouts a week.

D. Seven Fitness Program Components

1. Warm up. Proper warm up before exercise will not only improve individual performance, but also reduces the chance of injury from strain.

Increases blood and oxygen flow to the muscles and also raises the temperature in the muscles.

Warm up increases the blood flow to the extremities and away from the visceral area.

2. Flexibility. Increases the range of motion in joints by lengthening muscles.

3. Stretching. Don't stretch muscles until you have warmed up thoroughly.

a. Dynamic stretching involves slow, controlled

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movements to loosen up and stretch the muscle.

- b. Static or sustained stretching involves a stretch which is held for a period of time, 10-15 seconds up to 30 seconds.
- c. Ballistic stretching uses momentum to stretch a muscle. There is a risk of stretching the muscle past the optimal range of motion and causing injury when performing ballistic exercises or stretches.
- d. Proprioceptive neuromuscular facilitation or PNF stretching involves a static stretch which is held for 15 seconds followed by an isometric contraction for 7-15 seconds, followed by a stretch. The isometric contraction can be performed with the aid of a partner or using a stationary movement. New range of motion is normally substantial utilizing this stretching exercise technique. These exercises are a workout vice just a warm up.

4. Heart Rate Training

To determine your target/training heart rate, which is an indicator of the intensity level at which you are working, there are many different methods.

(1) Karvonen method

$220 - \text{age} = \text{Maximum Heart Rate}$

Instructor provide
sample formula

DISCUSSION POINT

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MHR x % (50-85) = Training/Target Heart Rate

calculation on board.

(2) Borg Scale (Rating of Perceived Exertion). This method is based upon the individual rating how hard they feel they are training. The scale ranges from 6 to 20, with 12 to 16 being the appropriate intensity level for most individuals.

RPE 6
7 Very Very Light
8
9 Very Light
10
11 Fairly Light
12
13 Somewhat Hard
14
15 Hard
16
17 Very Hard
18
19
20 Very Very Hard

5. Aerobic exercise

- a. Stimulates the heart and lungs, improves the body's use of oxygen. Exercises should be vigorous (60-75% of maximum heart rate) for 30 minutes without interruption and repeated 3 or more time per week.
- b. Aerobic exercise requires large amounts of O₂, use of large muscle groups, rhythmical in nature and can be maintained over time at moderate intensity.
- c. Primary aerobic exercises includes running. Biking, swimming, cross-country skiing, stair climbing, rowing, brisk walking and group

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exercise classes.

Secondary aerobic exercise includes group exercise classes, racquet sports, basketball and volleyball.

Non-aerobic activities include archery, fencing, softball, croquet and bowling.

- d. A heart rate monitor is the most accurate way to determine at what rate your heart is beating and ensure that you are training at the appropriate level for your goals.
 - e. With longer duration aerobic exercise, fat tends to be the preferred fuel.
 - f. For longer duration exercise, the intensity has to be appropriately lower, (60-75% HRI) or the body goes into an anaerobic state.
 - g. Most people can't initially maintain high intensity exercises for long duration.
 - h. For members who exceed bodyfat composition, ensure long duration exercises to maximize bodyfat loss.
 - i. Gradually lengthen exercise duration to 40-60 minutes at target heart rate of 60-75% for maximal fat burning.
6. Musculoskeletal exercise
- a. Increases musculoskeletal fitness through

DISCUSSION POINT

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range of motion, resistance, repetition, and recovery.

b. Principle of Opposition

- (1) Exercise regimes should emphasize symmetry.
- (2) Muscles are typically paired or oppose one another. Paired muscles should be exercised equally, if not muscular imbalances can lead to biomechanical problems.
- (3) Paired muscle groups include:
biceps/triceps, deltoids/latissimus dorsi, pectorals/rhomboids & trapezius, abdominals/erector spinae, quadriceps/hamstrings, thigh abductors/thigh adductors, tibialis anterior/gastrocnemius.

c. Principles of weight training

- (1) Low reps with heavier weights increases absolute strength and muscle size.
- (2) High repetitions increases dynamic strength and muscular endurance.

d. Strength gains are made through:

- (1) Hypertrophy, increase in the size of

DISCUSSION POINT

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the muscle fibers.

- (2) Motor Unit Recruitment, the percent of muscle fibers that can be used at one time. Sedentary individuals recruit only about 40% of the muscle fibers of a muscle group for a single maximal effort. Strength training increases this percentage greatly.
- e. Effects of age on strength: All ages will make significant gains in both absolute and dynamic strength. Younger individuals gain strength mostly by hypertrophy, while older individuals gain strength mostly by motor unit recruitment.
- f. Other training considerations
 - (1) Muscle fatigue is the result of the muscle fibers becoming impaired. Theories;
 - (a) Chemical changes in the muscle fibers
 - (b) Depletion of stored carbohydrate reserves (glycogen)
 - (c) Failure to remove the waste products of intense exercise (such as lactic acid)
 - (2) Immediate Muscle Soreness is most likely due to the accumulation of the

DISCUSSION POINT

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metabolic waste product (lactic acid).

Pain is short-lived and usually subsides soon after the intensity of the exercise is reduced.

Recovery appears to be enhanced by continued, very mild movement.

- (3) Delayed-onset muscle soreness is an overuse injury common to people trying to develop muscular strength.

Injury results from microscopic tears in the muscle fibers and may result from an influx of fluid to the affected area, causing pressure and a local inflammatory response.

- (4) Overtraining occurs when a person exercises too frequently, too intensely, and/or for too long during each exercise bout. Results in an increased risk of injury and a decrease in performance.

7. Cool down.

- a. A tapering off period and stretching session should always follow exercise.
- b. Allows for blood redistribution.
- c. Should last from 5-10 minutes.

DISCUSSION POINT

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E. Fuel for Exercise

- a. Carbohydrates are stored in the body as glucose. Glucose is stored in the muscles and liver in the form of glycogen. Glucose is converted into Adenosine Triphosphate (ATP) and used as an energy source.
- b. Fats are stored in the bloodstream as triglycerides and in the body as adipose tissue. Fat is converted into ATP and used as an energy source primarily during longer duration aerobic exercise.
- c. Protein is not normally used as an energy source. But it can be converted into ATP.
- d. We always utilize a combination of fat and carbohydrate at rest and during exercise.
- e. The proportion used is determined by:
 - (1) availability of carbohydrate
 - (2) intensity of exercise
 - (3) duration of exercise
 - (4) cardiovascular fitness level

F. Generation of ATP

1. ATP-PC system

DISCUSSION POINT

- a. Is an anaerobic energy system
 - b. severe exercise, 10 seconds or less
 - c. No O₂, CP + ADP = ATP
 - d. Fast Glycogenolytic (FG) fibers used
2. Anaerobic Glycolysis
- a. Breakdown of glucose, without oxygen
 - b. High intensity exercise 10-90 seconds
 - c. 400 m run, 100 m swim
 - d. Glucose/Glycogen = 2 lactic acid + 2 ATP
 - e. Fast Oxidative-Glycolytic (FOG) fibers used
3. Aerobic system
- a. Breaks down glucose and fatty acids with oxygen
 - b. Occurs in mitochondria
 - c. Moderate exercise greater than two minutes
 - d. Slow twitch oxidative (SO) and (FOG) fibers used

RELATED INSTRUCTOR ACTIVITY

Review powerpoint charts

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

SUMMARY AND REVIEW

A. State Lesson Objectives

Turn to cover page for objectives.

B. Review Major Teaching Points

Briefly summarize.

APPLICATION

None.

EVALUATION

None.

ASSIGNMENT

None.

LESSON PLAN

JANUARY 2005

COURSE TITLE: Physical Training
Instructor Training Course
P-9E-1238

CLASSIFICATION: Unclassified

LESSON TOPIC NUMBER: 1.8

LESSON TOPIC: Injury Prevention and
Hygiene

ALLOTTED LESSON TIME: 1.0 Classroom
0.5 Lab

INSTRUCTIONAL SUPPORT:

- 1 Classroom Instructor
- 1 Laboratory Instructor

INSTRUCTIONAL REFERENCES:

- 1. Cooper Institute
- 2. New Fitness Coordinator Exercise
Leader Handbook
- 3. Naval Special Warfare Calisthenics:
Sports Medicine Conference Summary

INSTRUCTIONAL AIDS:

- 1. PowerPoint Presentation
- 2. Student guide
- 3. Student Handout

TERMINAL OBJECTIVE:

Partially supported by this lesson topic:

- 1.0 Upon completion of this unit of instruction the Physical Training Instructor Under Training will demonstrate knowledge to instruct, demonstrate, and facilitate students in the NAVAVSCOLSCOM Physical Training Instructor (PTI) Course curriculum without injury to personnel or damage to equipment.

ENABLING OBJECTIVES:

Completely supported by this lesson topic:

- 1.24 Describe factors influencing injuries.
- 1.25 Describe treatment of injuries related to physical training.
- 1.26 Explain prevention of sports related health problems.

CRITERION TEST:

None

HOMEWORK:

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

None

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

INTRODUCTION

A. Establish Contact

Display name and lesson topic.

1. Introduce self, give rank, current job.
2. State background, schools, duty stations, etc.
3. State question and answer policy.
4. Describe nonverbal TTO signal.

Nonverbal Training Time Out may be signaled by placing a hand horizontally over a hand held vertically forming the letter "T".

B. State Lesson Objectives

Turn to cover page of lesson plan and paraphrase objectives.

C. Establish Readiness

1. Motivating statements

In preparation to be a Physical Training Instructor, you must be knowledgeable of injury prevention and management while physical training.

Establish importance and relevance of lesson material using personal experience or anecdote.

2. Lesson overview

Briefly outline material to be covered.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (a) Lesson Topic: Injury Prevention and Hygiene
- (b) Major Teaching Points:
 - (1) Factors influencing injuries
 - (2) Types, symptoms and treatment of sports related injuries and health problems
 - (3) Musculoskeletal risk factors for exercise
 - (4) How to select the right shoe

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

PRESENTATION

A. Factors influencing injuries

1. The body was designed to take physical strain.
 - (a) Effects of a sedentary lifestyle are not easily overcome.
 - (b) A sudden, severe change in the level of physical activity can result in strained muscles or even more serious injuries.
 - (c) Be realistic about expected improvements when beginning an exercise program.
 - (d) Many injuries are caused from overuse.
2. Exercise in moderation to help prevent injuries.
 - (a) Take time to warm up and cool down.
 - (b) Define realistic goals.
 - (c) Improvements take time.
 - (d) When you experience pain, decrease your activity level or stop exercising altogether.
 - (e) Pay attention to unexplained soreness, lowered resistance, depression, and chronic

DISCUSSION POINT

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fatigue.

- (f) Most sports injuries can be taken care of with minimal effort and plain common sense.
- 3. Make sure that you and your competition are well matched.
- 4. Do not lift weights that are beyond your capability. When lifting weights, be sure to have a spotter.
- 5. Facilities and equipment are very important to injury prevention.
 - a. Make sure they are adequate.
 - (1) Playing on a poorly maintained playing field can result in injury.
 - (2) Run on soft surfaces (dirt or grass) instead of concrete or blacktop whenever possible.
 - (3) If a sport calls for protective equipment, wear it! Examples include helmets while bike riding, shin guards and cleated shoes for soccer and eye guards for racquetball.
 - (4) Know how to use the equipment properly and maintain it in good condition.

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- (5) Know when to replace your equipment.
- (6) Use the proper shoe for the proper sport that you play.

6. Avoid certain exercise that are known to cause injury.

B. Types of sports related injuries and health problems

1. Blisters

- (a) A fluid filled sack that forms where the skin is rubbed excessively.
- (b) They are often encountered when breaking in a new pair of shoes.
- (c) First aid treatment
 - (1) Under normal conditions do not break the blister. The only circumstances where you should break the blister is if you are participating in a long term event, such as a marathon, eco-challenge.
 - (2) Puncture the edge of the blister with a sterile needle and drain the fluid if continuing on a long event.
 - (3) Apply an antiseptic and cover with a

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clean dressing.

- (4) Blisters can become infected, so keep the area clean and check frequently.

2. Shin splints

- (a) Characterized by a sharp pain in the front portion of the lower leg from inflammation of the muscle or tendons.
- (b) Usually associated with sudden changes in the frequency, duration and intensity of exercise often occurring in conjunction with running on hard surfaces.
- (c) Therapy: appears to be total rest, even light levels of exercise appear to interfere with the healing process.
- (d) Prevention is best accomplished by using proper footwear, increasing exercise volume gradually and choosing the right type of exercise surface.

3. Fractures

- (a) Complete fracture occurs when a bone breaks in two or more pieces.
- (b) Stress fractures are hairline cracks that often occur in the bones of the feet or

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

shins, usually associated with running.

(c) Symptoms - Pain around the fractured bone.

(d) First Aid

(1) Immobilize the joint.

(2) Elevate the appendage.

(3) Call for medical assistance immediately.

4. Strains

(a) Involves tearing or rupturing of muscle tissue.

(b) Stretched or torn usually because of overstretching, overuse, or sudden or violent wrenching.

(c) Symptoms include point tenderness, decreased mobility and dysfunction, slight to moderate swelling depending upon the severity, discoloration with greater tissue involvement.

(d) First Aid

(1) Best treatment for a typical muscle strain is to apply ice in a cycle of 10 minutes on and five minutes off to

DISCUSSION POINT

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reduce pain and swelling. Ice should be used during the first 48 hours following injury.

- (2) This should be best accompanied by applying compression with a bandage and elevation of the injured area.
- (3) Heat may be applied after the first 48 hours.

5. Sprains

- (a) A joint injury involving the stretching or tearing of connective tissue.
- (b) Caused by sudden or violent twisting of the joint, ligaments are stretched or torn.
- (c) Symptoms include pain and point tenderness, swelling, discoloration, and dysfunction.
- (d) First Aid is the same as muscle strain.

6. Torn Meniscus

- (a) A very common knee injury; usually occurs in collision sports.
- (b) Symptoms include point pain.
- (c) Requires surgical repair in severe tears.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

7. Bursitis

- (a) Inflammation of the bursa. There are more than 140 bursae sacs in the joints of the body. Inflammation may be due to friction, trauma, contusion (bruise) or dysfunction.
- (b) Symptoms include pain and discomfort upon movement, dysfunction.
- (c) Treatments include rest, ice, and anti-inflammatory medications.

8. Tendonitis

- (a) The inflammation of a tendon.
- (b) Symptoms include pain and discomfort upon movement, dysfunction.
- (c) Treatment is same as for bursitis.

9. Dislocation

- (a) Displacement of the bones forming a joint.
- (b) Symptoms include appears grossly deformed and is dysfunctional, intense pain, occasional swelling.
- (c) Immobilize and get injured person to a

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

physician. Never attempt to reduce a dislocation. Apply ice around the joint if possible.

9. Plantar Fasciitis

- (a) Symptoms include point tenderness on the bottom of the heel, usually the medial side. Pain on walking, subsides when warm, returns when cold again. Causes include shoe with stiff soles and/or poor arch support. Overpronation is another common cause of this disorder.
- (b) Treatment includes rest, ice, heel cups or inserts, shortened stride, replace shoes, calf stretching exercises, use a low impact activity temporarily or run on a softer surface.

10. Chondromalacia

- (a) Described as softening of the cartilage.
- (b) Is an overuse injury of the knee in which the kneecap becomes softened or roughened on the backside.
- (c) It is a runner's injury.
- (d) Occurring in people with a biomechanical abnormality such as pronation of the foot,

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

knock-knee, or a misaligned knee cap.

- (e) A person with this condition should not be running or doing weight bearing exercises.
- (f) Cycling is excellent for rehabilitation as long as a very low gear and high revolutions are used, and only if the cycling does not cause pain.

11. Athlete's Foot

- (a) Is a fungus that causes itching, scaling and cracking of the skin. The area between the toes is especially susceptible and may reveal blisters containing a thin, watery fluid.
- (b) Antifungal medication, proper hygiene which includes thorough washing and drying of feet.
- (c) Prevention includes good personal hygiene, proper laundering of towels and clothing and general cleanliness in showers and dressing room. Use of a fungicidal agent to disinfect benches and floors of shower areas.

12. Jock/crotch itch

- (a) A fungus infection occurring in the area of the upper thighs. Growth of this organism is favored by obesity and tight clothing and is often recurring.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (b) Same treatment as for athlete's foot, but for specified area.
- (c) Prevention includes the same measures as for athlete's foot, in addition to loosening clothing around the thigh area to reduce friction in that area.

13. Onychomycosis

- (a) Onychomycosis of the nail beds is a chronic infection involving one or more of the nails of the hand or foot. Either the nail gradually thickens, discolors, becomes brittle, and has caseous-appearing material form beneath it, or it becomes chalky and disintegrates.
- (b) Treatment and prevention measures are the same as for athlete's foot.

Note: If an instructor or athlete is ever in question of the severity of an injury, always have the injury examined by a Medical Officer!

C. Musculoskeletal risk factors for exercise

1. Low back pain.

- (a) Safest course of action for this condition is to seek treatment from a Medical Officer.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

2. Obesity

- (a) Exercise programs for obese individuals need to be modified because of the greater chance of musculoskeletal injury and overexertion.
- (b) Obesity is often accompanied by hypertension, hyperlipidemia and diabetes. Is a primary risk factor for coronary heart disease.
- (c) Generally obese individuals have a low muscle mass relative to fat and have a low aerobic capacity.
- (d) Their programs should minimize weight bearing and excessive shock to the joints.
- (e) All are more appropriate for obese individuals than jogging.
- (f) Greater emphasis should be placed on duration rather than intensity of exercise, since exercise duration is more effective in weight control.
- (g) Obese individuals cannot dissipate heat well, so strenuous exercise should be avoided on hot, humid days.
- (h) Water activities are recommended for obese individuals since the body is supported by

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

water and the risk of joint and muscle injury is reduced.

- (i) Refrain from running or weight bearing exercises (unless conducted in water).

D. Treatment of injuries

1. P.R.I.C.E.

- (a) **P**rotect the part.
- (b) **R**est a day or two.
- (c) **I**ce as soon as possible, wrap the ice in a towel and repeat ten minutes on/five off for best results. Ice reduces swelling and pain by constricting the blood vessel and reducing blood flow to that area.
- (d) **C**ompress the area with an elastic bandage for 30 minutes, remove it for 15 minutes and compress for another 30 minutes. If the area is numb, the bandage is too tight. Compression also aids in the reduction of swelling.
- (e) **E**levate the injured part to help drain excess fluid from the area. This should be done even while sleeping.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

2. You should seek a Medical Officer if:
 - (a) You cannot move the injured part
 - (b) The injury is not healing
 - (c) Pain persists or is severe
3. Heat
 - (a) Heat may be applied 48 hours after an injury, once the swelling has subsided.
 - (b) Heat increases circulation, helping to reduce any residual swelling.
 - (c) The increased circulation also brings in more nutrients to provide energy for healing, including proteins, the body's building blocks.
4. Anti-inflammatory agents and pain relievers
 - (a) When inflammation occurs, such as arthritis, anti-inflammatory agents may be necessary to reduce the inflammation.
 - (b) Ibuprofen is the active ingredient found in anti-inflammatory drugs such as:
 - (1) Motrin

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

(2) Advil

- (c) Once the inflammation is under control, rehabilitation can begin.
- (d) Starting exercise before inflammation is reduced can increase the inflammation.
- (e) Pain relievers may be used for intense pain while the injury heals.
- (f) But they should never be used to mask pain so that physical activity can be continued. This will only aggravate an injury and prolong recovery.

5. Rehabilitation

- (a) Rehabilitation requires days or months depending on the nature and severity of the injury.
- (b) If injury is not too severe, encourage participant to exercise the "well-part" of the body to maintain cardiovascular and strength conditioning.
- (c) Rehabilitation should not be started until the pain is gone.
- (d) Severe injury rehabilitation should be under the supervision of a physician or physical

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

therapist.

- (d) It should be started gently and intensified gradually.
- (e) Returning to intense exercise too quickly invites re-injury.
- (f) Rehabilitation is not complete until the injured part has:
 - (1) Normal range of motion
 - (2) Normal strength
 - (3) Normal function

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

E. The Foot's Role in Walking

1. The foot plays one of the most important roles in walking. It must compensate for every structural abnormality in the skeleton above. The foot must modify its function for such conditions as a curved spine, limb length difference, and muscle shortening or imbalance. The failure of the foot to adequately adapt to structural imperfections in the body will result in the eventual breakdown of foot structure. It is this collapse of the foot, known as abnormal pronation which leads to flat feet, heel spurs, bunions, and hammertoes, and is also responsible for chondromalacia, as well as many cases of hip and back pain.

2. The gait cycle is important to help you better understand how the foot functions and malfunctions during walking. The first part of the gait cycle is known as heel contact. This begins as the outside part of your heel touches the ground. If you examine the bottom of a well worn shoe, you'll notice that part of the heel is worn more on the outside than the inside. This is normal. During this heel contact stage, your foot pronates, causing your foot bones to become loose. This normal pronation is the same force as abnormal pronation, but over a shorter period of time. The foot must pronate for a moment at heel contact to adapt to an often uneven walking surface. This initial pronation also acts as a shock absorber for the upper body and helps to smooth out the

Have students do WET TEST and trace prints with marker. Retain for later

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

walking pattern. Abnormal pronation is a condition in which the foot continues to collapse beyond this initial phase.

3. Mid stance is the next phase of the gait. At this point the leg is directly above the foot and the bones and joints of the foot should now be moving in the opposite directions of pronation. This motion is known as supination and causes the foot to act as a rigid lever. It is necessary for the foot to be rigid for the next stage of gait, which is known as the propulsive phase. In this stage, the leg passes over the foot and the heel lifts off. In individuals with short or tightened calf muscles, this heel lift may be premature and result in a jerky gait. This condition, called equinus, is also a destructive force on the foot. Propulsion is completed as we push off our toes. The big toe exerts the greatest force in this action, with a relatively insignificant contribution from each of the lesser toes.
4. The final stage of gait is known as the swing phase. During this period, your thigh flexes and your leg extends, swinging your foot forward where it prepares for the next step.
5. The structure of your foot also influences the way you walk. The height or your arch is an important structural feature. A dramatic decrease in the arch when you step down is a sign of abnormal pronation. The abnormally pronated foot must be

DISCUSSION POINT

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differentiated from the ordinary low arched foot. An arch which is low and remains the same both off and on weight bearing is probably perfectly normal.

Most authorities agree that a medium arch height is the most desirable. People with arches of medium height suffer less foot injury than either people with high or low arch heights. The higher arched foot is normally a very poor shock absorber. If you have a high arched foot, you are most likely to suffer from knee, hip, or back pain.

F. How To Select The Right Shoe

1. The Wet test

- (a) Have personnel get their feet wet and stand on a hard surface leaving footprints on paper.

Have students evaluate their footprints

2. Feet normally fall into 1 of 3 categories.

(a) Flat feet

- (1) Loose jointed
- (2) Need shoes built to control the foot's motion (normally over pronator).
- (3) Rolls in excessively toward the midline of the body as it bears weight.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (4) Indicated by extreme wear on inside and outside of the shoe sole. The inside edge of the sole is broken down from rolling in.
 - (5) Typical injuries are arch pain, heel cord pain, shin pain, and knee pain (kneecap or inside of knee).
 - (6) Select a shoe with dual density mid-sole with the firmer, denser area on the inside, external heel counter and good arch support.
- (b) High arch
- (1) Tight-jointed
 - (2) Do not yield enough upon impact
 - (3) Need shoes that cushion the impact of running.
 - (4) Extreme wear on outside of the sole of the shoe indicating under-pronation (supination).
 - (5) Typical injuries: shin splints, stress fractures, knee pain, hip pain, heel pain, and ankle sprains.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (6) Shoe selection: maximum shock absorption and cushioning, dual density mid-sole, with the firmer denser portion on the outer edge, flexible sole, elevate heel. Avoid flared heel.

(c) Normal feet

- (1) Tends to conform to the ground without excess motion.
- (2) Slight wear on the outside of the shoes sole.
- (3) Normal arch.
- (4) No typical injuries.
- (5) Shoe selection: balance of motion control and cushioning, flexible sole and a durable out-sole appropriate for the running surface.

Remember: Replace the shoes when they have accumulated 500 miles or six month's use!

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

SUMMARY AND REVIEW

A. State Lesson Objectives

Turn to cover page for objectives.

B. Review Major Teaching Points

Briefly summarize.

APPLICATION

None.

EVALUATION

None.

ASSIGNMENT

None.

LESSON PLAN

JANUARY 2005

COURSE TITLE: Physical Training
Instructor Training
Course, P-9E-1238

CLASSIFICATION: Unclassified

LESSON TOPIC NUMBER: 1.9

LESSON TOPIC: Cardiorespiratory System

ALLOTTED LESSON TIME: 1.5 Classroom
1.0 Laboratory

INSTRUCTIONAL SUPPORT:

- 1 Classroom Instructor
- 1 Laboratory Instructor
- 1 Assistant Instructor

INSTRUCTIONAL REFERENCES:

- 1. New Fitness Coordinator Exercise Leader Handbook
- 2. Exercise Physiology (Third Edition)
- 3. American Lung Association Web Page

INSTRUCTIONAL AIDS:

- 1. PowerPoint presentation
- 2. Student Guide
- 3. Blood Pressure Cuffs/Sphygmometers
- 4. Cholesterol Training Aid
- 5. Human Heart Training Aid
- 6. Heart/Lung Model

TERMINAL OBJECTIVE:

Partially supported by this lesson topic:

- 1.0 Upon completion of this unit of instruction the Physical Training Instructor Under Training will demonstrate knowledge to instruct, demonstrate, and facilitate students in the NAVAVSCOLSCOM Physical Training Instructor (PTI) Course curriculum without injury to personnel or damage to equipment.

ENABLING OBJECTIVES:

Completely supported by this lesson topic:

- 1.27 Describe the major components of the cardiorespiratory system.
- 1.28 Explain the function of the cardiorespiratory system.
- 1.29 Identify and explain cardiorespiratory terms and formulas
- 1.30 Identify effects of drugs/stimulants
- 1.31 Identify cardiorespiratory diseases.
- 1.32 Identify primary risk factors for coronary heart disease.
- 1.33 Identify secondary risk factors for coronary heart disease.
- 1.34 Perform blood pressure measurement.

CRITERION TEST:

None

HOMEWORK:

None

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

INTRODUCTION

A. Establish Contact

Display name and lesson topic.

1. Introduce self, give rank, current job.
2. State background, schools, duty stations, etc.
3. State question and answer policy.

B. State Lesson Objectives

Turn to cover page of lesson plan and paraphrase objectives.

C. Establish Readiness

1. Motivating statements

Establish importance and relevance of lesson material using personal experience or anecdote.

2. Lesson overview

Briefly outline material to be covered.

a. Lesson Topic: Cardiorespiratory System

b. Major Teaching Points:

- (1) Major components of the cardiorespiratory system
- (2) Function of the cardiorespiratory system
- (3) Identify cardiorespiratory terms and formulas.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (4) Identify cardiorespiratory diseases.
- (5) Identify effects of drugs and stimulants.
- (6) Identify primary risk factors for coronary heart disease.
- (7) Identify secondary risk factors for coronary heart disease.
- (8) Perform blood pressure measurements.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

PRESENTATION

A. Basic concepts of Cardiorespiratory Exercise

Cardiorespiratory conditioning consists of both aerobic exercise, which requires oxygen to sustain muscle activity, and anaerobic exercise, which does not use oxygen for the short bursts of highly intense activity. Most daily work and activities are aerobic in nature, and thus, improving the delivery of oxygen to the working skeletal muscle will improve work performance. Your ability to utilize oxygen for exercise depends on a variety of processes including:

1. Respiration
2. Ability to increase heart rate/amount of blood pumped
3. Ability of blood vessels in and surrounding skeletal muscle to regulate blood flow
4. Ability of contracting skeletal muscles to extract and use oxygen in blood

Two other factors, which help determine maximal aerobic capacity, are your percentage of specific muscle fiber types and your genetic makeup.

B. Major components of the cardiorespiratory system.

1. Heart. The heart is about the size of a fist, located under the breastbone, between the right and left lungs. It is comprised of four compartments, a right and left atrium and a right and left ventricle. Blood low in oxygen flows through blood vessels (vena cava) into the right

DISCUSSION POINT

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atrium and then into the right ventricle. From the right ventricle, blood flows through the pulmonary artery into the right and left lungs. The oxygen rich blood flows from the lungs back into the left atrium and then into the left ventricle. From the left ventricle it flows through the aorta and back into the body. Coronary arteries deliver blood to the heart via the aorta.

2. Arteries carry oxygen rich blood to the capillaries.
3. Capillaries provide oxygen and nutrients to the body tissues and also remove waste products and carbon dioxide from the tissues.
4. Veins carry blood back to the heart for oxygenation.
5. Lungs. The lungs are cone shaped organs that lie in the thoracic cavity.
6. Bronchi carry air to each lung and further subdivide into bronchioles.
7. Bronchioles are smaller than bronchi and terminate at the alveoli.
8. Alveoli are thin, microscopic air sacs within the lungs. They are in direct contact with the pulmonary capillaries. It is here that fresh oxygen exchanges with carbon dioxide.
9. Hemoglobin is the substance found in red blood

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

cells which binds to and carries oxygen through the blood stream.

- C. The function of the cardiorespiratory system is to provide oxygen and nutrients to the body while also removing carbon dioxide and waste products from the body. With a regular exercise program involving cardiorespiratory conditioning, physiological adaptations will take place.
- D. Cardiorespiratory Terms
 - 1. Cardiac Output is the amount of blood pumped by the heart per minute. Usually expressed in liters/ minute.
 - 2. Stroke Volume is the amount of blood pumped by the heart per beat. Usually expressed in ml/beat.
 - 3. Heart rate is how many times the heart beats per minute.
 - 4. a-v O₂ Difference is the difference in the amount of oxygen in the arteries vs. the veins. This reflects how much oxygen has been used at the tissue level.
 - 5. Max VO₂. The maximal amount of oxygen that can be utilized by the body per minute. Usually expressed in ml./kg/min. This is referred to also as cardiovascular or cardiorespiratory fitness level, maximal oxygen consumption, aerobic power.

DISCUSSION POINT

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- 6. Metabolic rate is the same thing as oxygen consumption/caloric expenditure. At the average, oxygen consumption is 3.5 ml o₂/kg body weight/min.

E. Cardiorespiratory Training

- 1. As you get fit through aerobic training, the body can pull more oxygen out of the capillaries. The heart also puts out more blood per stroke volume (more blood with each beat of the heart). The degree of aerobic training is closely tied to the intensity and total work, not to frequency of training. A minimum of 3 days per week is recommended to see improvement.
- 2. A greater training improvement will be noted if you train above 85% of V_{O2} max or 90% of your maximal heart rate once a week or every other week (interval training).
- 3. Aerobic capacity will improve if exercise increases your heart rate to at least 70% of your maximum heart rate.
- 4. Maximal heart rate for swimming and other upper body exercise is lower than maximal heart rate for leg or whole body exercise. Training heart rate can be 13-15 beats lower for upper body/ swimming exercises such as running, biking, etc.

**Example of the Relationship Between Exercise,
Capacity, and Heart Rate**

Exercise Intensity	Oxygen Uptake	Heart Rate
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DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

<u>% of Maximum</u>	<u>(ml/kg/min)</u>	<u>(bpm)</u>
100% - Maximal	55	200
90% - Strenuous	50	187
70% - Moderate	39	160
50% - Easy	28	131

F. Drugs and stimulants

1. Anabolic steroids function in a manner similar to the principal male hormone testosterone. Binding with special receptor sites on muscle and other tissues, this hormone greatly contributes to the male secondary sex characteristics and to the gender differences in muscle mass and strength. Safe doses do not increase strength. Side effects include:
 - a. Acne
 - b. Excessive body hair
 - c. Breast enlargement
 - d. Testicular atrophy/dysfunction
 - e. Lowered sperm count
 - f. Increased risk of cancers
 - g. Increased risk of coronary heart disease

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- h. Violent behavior
- 2. Beta blockers are prescribed for angina pectoris (chest pain) and hypertension. They decrease blood pressure and heart rate, thus increase the capacity for exercise. People on beta blockers will not get an accurate measure of their intensity level from a heart rate monitor or the Karvonen Method. The Rating of Perceived Exertion scale is more appropriate for determining intensity level.
- 3. Nitroglycerin is used to treat angina. It increases heart rate and may cause lowered blood pressure during exercise, resulting in dizziness.
- 4. Pseudoephedrine Hydrochloride (sudafed) stimulates receptors in the respiratory tract producing vasoconstriction. Side effects may include:
 - a. Anxiety
 - b. Tremors
 - c. Dizziness
 - d. Headaches
 - e. Insomnia
 - f. Heart palpitations
 - g. Hypertension

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

5. Pseudoephedrine Hydrochloride with Triprolidine (Actifed) temporarily relieves nasal congestion, hay fever, reduces swelling of nasal passages. Side effects may include:
 - a. Drowsiness
 - b. Diarrhea
 - c. Nausea
 - d. Vomiting
 - e. Increased urinary output

6. Alcohol is classified as a drug because it depresses the central nervous system. Side effects include:
 - a. Alcohol interferes with oxygen uptake in the body.
 - b. Decreases work capacity.
 - c. Slows reaction time
 - d. Diuretic, promotes dehydration, causing heat related illness.

7. Caffeine is a stimulant. It may enhance the capacity for exercise. Side effects may include:
 - a. Headache

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- b. Insomnia
- c. Nervousness
- d. Irritability
- e. Raised heart rate
- f. Potent diuretic, promoting dehydration, heat related illness.

8. Illicit drugs such as amphetamines, cocaine, and marijuana. These drugs are a powerful stimulant to the central nervous system. Continued use can cause physiologic or emotional drug dependency. Some side effects include:

- a. Headaches
- b. Fever
- c. Dizziness / confusion
- d. Suppresses the body's normal mechanism for pain
- e. Fatigue and heart stress

G. Cardiorespiratory (Pulmonary) Diseases

1. Asthma is a lung disease which can be life threatening. Three things happen when you have an asthma attack.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- a. More mucus than normal is produced in the lungs. This may obstruct and lead to swelling of air tubes in the lungs. The muscles in the air tubes then tighten and narrow, making it hard to breathe.
- b. Exercise can be a potent stimulus for bronchio-constriction. Acute episode of airway obstruction is often apparent within 10 minutes after exercise; recovery usually occurs between 30 to 90 minutes.

2. Emphysema involves destruction of the alveoli in the lungs. It is irreversible and results in permanent holes in the tissues of the lower lungs. As air sacs are destroyed, the lungs are able to transfer less and less oxygen to the bloodstream, causing shortness of breath. The lungs also lose their elasticity. The patient experiences great difficulty exhaling.

1.8 million Americans have emphysema 80-90% of these cases are caused by cigarette smoking.

H. Cardiovascular Disease is a disease of the heart and/or the circulatory system. It is the leading cause of death in U.S. Highest in the south and lower in the northwestern states. This study conducted in 1994, looked at the death rates from heart disease in young men between the ages of 35 and 44. Researchers found that states with high rates of cigarette smoking, such as Kentucky and Tennessee, had high mortality rates. The data suggest that regional differences in death rates are due to lifestyle rather than medical care. **There are four major types of cardiovascular disease:**

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

1. Coronary Heart Disease
 - a. Build up of fatty plaque in the Coronary arteries (atherosclerosis)
 - b. The plaque ruptures and then a clot forms causing heart attacks.
 - c. 1.5 million heart attacks occur each year.
2. Cerebrovascular Disease (stroke)
 - a. Build up of fatty plaque/clots in the brain.
 - b. Some strokes are cause by ruptured blood vessels.
3. Congestive Heart Failure (CHF)
 - a. The heart pumps out less than it receives
 - b. Leads to swelling of the heart, lungs, and the rest of the body. Usually preceded by heart attack.
4. Peripheral Vascular Disease
 - a. Buildup of fatty plaques/clots in extremities.
 - b. Causes limb pain, gangrene, amputation
 - c. Occurs most in smokers and diabetic's

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

I. Disease process

1. Blood is supplied to the heart muscle through coronary arteries.
2. Supplies oxygen, nutrients, and removes waste.
3. Arteries are narrowed by plaque.
4. Pieces of plaque break off and cause a complete blockage, which prevents oxygen from getting to the heart.
5. Heart tissue then starts to die.

J. Primary risk factors for Coronary Heart Disease.

1. Cigarette Smoking

- a. Smokers are more than twice the risk of heart attack, three times the risk of stroke and four times risk of peripheral vascular disease as non smokers.
- b. Quitting smoking is the most significant lifestyle change a smoker can make.

New study 00

2. Cholesterol

- a. Is obtained in the diet and the human body manufactures its own cholesterol in the liver. Some people manufacture more than others. It is a white, fat-like substance

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

found in all foods of animal origin. **NOTE:** Fat and cholesterol are NOT the same. It is part of every cell and forms a part of bile acids that digest fat. LDL cholesterol is a major component of the plaque found in arteries.

Function - Myelin sheath nerve fibers.

- b. All Americans should limit cholesterol intake to 300mg a day. Some foods higher in cholesterol include liver, organ meats, egg yolk and red meats.
- c. Two types of cholesterol
 - 1. Low-density lipoprotein (bad) causes arterial damage and is a major component of plaque.
 - 2. High density lipoprotein (good)
- d. Genetics, diet, physical activity, percent body fat, stress, age, gender, are all factors that affect cholesterol levels
- e. HDL should be > 35mg/dl and 130-159 is considered slightly elevated for LDL's. LDL measurement over 160 is considered seriously elevated.
- f. Regular aerobic exercise, decrease saturated fat intake, decrease cholesterol intake,

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

increase soluble fiber intake, loss of body fat, stress management and the control of diabetes are lifestyle factors that can decrease LDL's.

- g. Regular aerobic exercise, loss of body fat, Smoking cessation, and decrease blood Triglyceride levels are lifestyle factors that increase High Density Lipoprotein (HDL-C)

3. High Blood Pressure (Hypertension)

- a. Uncontrolled high blood pressure can damage blood vessels in the heart, kidneys, and others organs.
- b. High blood pressure is usually controllable, treatment may include diet changes and increased exercise. Medication to lower the blood pressure may be used if diet and exercise are ineffective.
- c. Major links to hypertension are Obesity, sedentary lifestyle, smoking, chronic stress, excessive alcohol intake, aging, excessive sodium intake, genetics.

4. Diabetes

- a. Two types: Non-insulin and insulin dependent. Over 16 million Americans have diabetes.

Definition: Fasting blood glucose ≥ 140

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- mg/dl on two separate occasions.
- b. Major causes of non-insulin dependent diabetes are obesity and sedentary lifestyle.
 - c. Regular aerobic exercise, decrease simple sugar intake, loss of body fat, control of diabetes, and increase dietary fiber increase are all factors that decrease blood glucose.
5. Family history
- a. Family history of heart disease is good indication of you having CHD.
6. Sedentary lifestyle
- a. People who lead sedentary lives may have a higher risk of heart attack than those who get regular, vigorous exercise.
 - b. Cardiovascular fitness is inversely related to blood pressure, LDL's, Triglycerides, blood glucose, and body fat.
7. Age
- a. Men over the age of 45 and women over the age of 55 are more at risk of CHD.
8. Obesity
- a. Is defined as 20 percent more than your

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

desired body weight.

- b. Obesity increases the risk of CHD by typically increasing blood cholesterol, Triglyceride, glucose, and insulin level, as well as blood pressure.
- c. Abdominal pattern obesity is the most significant.

K. Secondary risk factors

1. Elevated blood Triglyceride level

- a. Levels greater than 150mg/dl are associated with increased risk of CHD.

2. Stress

- a. Chronic stress can have an adverse impact on high blood pressure and blood; lipid values, and leads to a risk of CHD.

L. Measuring Blood Pressure

- 1. Insure participant is free from stimuli and sits quietly for a few minutes with feet flat on the floor and forearm near heart level.
- 2. Apply BP cuff snugly, 2.5cm above the anticubital space and centered on the brachial artery.
- 3. Tighten the screw and the rubber bulb

DISCUSSION POINT

clockwise so that you can pump up the cuff.

4. Place the stethoscope over the brachial artery and pump up the cuff to 180mmHg. Continue to deflate.
5. Slowly deflate by twisting the screw on the bulb counterclockwise.
6. The first rhythmical beat heard through the stethoscope is the systolic pressure.
7. When the heartbeat is no longer heard, note the number on the gauge, diastolic pressure.

NOTE: The subject should not talk or move during the measurement.

RELATED INSTRUCTOR ACTIVITY

Be aware that some stethoscopes have an on/off position.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

SUMMARY AND REVIEW

A. State Lesson Objectives

Turn to cover page for objectives.

B. Review Major Teaching Points

Briefly summarize.

APPLICATION

See Presentation for Application.

EVALUATION

None.

ASSIGNMENT

None.

LESSON PLAN

January 2005

COURSE TITLE: Physical Training
Instructor Training
Course,P-9E-1238

CLASSIFICATION: Unclassified

LESSON TOPIC NUMBER: 1.10

LESSON TOPIC: Exercise in Extreme
Environments

ALLOTTED LESSON TIME: 1.0 Classroom

INSTRUCTIONAL SUPPORT:

1 Classroom Instructor

INSTRUCTIONAL REFERENCES:

1. New Command Fitness Coordinator
Exercise Leader Handbook
2. American Lung Association Web Page

INSTRUCTIONAL AIDS:

1. PowerPoint Presentation
2. Student Guide
3. Handout

TERMINAL OBJECTIVE:

Partially supported by this lesson topic:

- 1.0 Upon completion of this unit of instruction the Physical Training Instructor Under Training will demonstrate knowledge to instruct, demonstrate, and facilitate students in the NAVAVSCOLSCOM Physical Training Instructor (PTI) Course curriculum without injury to personnel or damage to equipment.

ENABLING OBJECTIVES:

Completely supported by this lesson topic:

- 1.35 Identify heat stress
- 1.36 Identify cold stress
- 1.37 Explain pollution's affect on you while exercising
- 1.38 Explain high altitude's effect on you while exercising

CRITERION TEST:

None

HOMEWORK:

None

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

INTRODUCTION

A. Establish Contact

Display name and lesson topic.

1. Introduce self, give rank, current job.
2. State background, schools, duty stations, etc.
3. State question and answer policy.

B. State Lesson Objectives

C. Establish Readiness

1. Motivating statements

In preparation to be a Physical Training Instructor you must be knowledgeable of environmental effects on the human body while participating in and conducting physical training.

Establish importance and relevance of lesson material using personal experience or anecdote.

2. Lesson overview

The purpose of this lesson topic is to introduce the student to the effects of exercising in extreme environments.

Briefly outline material

a. Lesson Topic: Exercise in Extreme Environments

b. Major Teaching Points:

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (1) Heat Stress
- (2) Cold Stress
- (3) Air Pollution
- (4) Effects of High Altitude

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

PRESENTATION

A. Heat stress

1. Physiological effects of heat. The hypothalamus is a specialized area in the brain. It regulates appetite, sleep, and also acts as the body's thermostat, making adjustments whenever it detects a change in the core body temperature. These adjustments facilitate the loss of heat in warm weather exercise, or the conservation of heat in cold weather exercise. The hypothalamus also controls the sweating mechanism.
 - a. Dehydration. Heavy sweating combined with lack of sufficient fluid intake can lead to dehydration.
 - b. Heat Injury occurs in different degrees when the body is unable to dissipate heat.
2. Physiological mechanisms for adjusting to heat.
 - a. When you exercise for prolonged periods of time, your body must find a way to shed the newly created heat. The core temperature rarely rises more than 2-3 degrees Fahrenheit. Loss of this heat is accomplished through several mechanisms. Evaporation of perspiration is the most effective method to ensure adequate cooling. As the core temperature begins to rise, the body begins to shunt more blood to the blood

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

vessels in the skin, which explains why the skin takes on an increasingly redder color with prolonged exercise. The sweat glands begin secreting perspiration. When the perspiration evaporates, heat is lost, thus cooling the surface of the skin.

- b. Environmental Factors
 - (1) Temperature
 - (2) Wind
 - (3) Humidity
 - (4) Direct Sunlight
- 3. Factors that hinder body cooling in the heat
 - a. Humid heat: As the humidity increases, evaporative cooling slows due to saturation of the air with moisture.
 - b. Skin disorders: Injuries such as deep thermal burns, sunburn or rashes will prevent or hinder sweating.
 - c. Clothing: Any clothing that is impermeable to water vapor will compromise cooling.
- 4. Sweat Glands
 - a. 2-3 million

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

b. Up to 1-2 liters of fluids can be lost per hour.

5. Heat acclimation

a. Adapting to a hot environment can take one to three weeks, for physically fit individuals, 75% of acclimation occurs during the first week of heat exposure. During this time, sustained physical activity is more difficult and onset of fatigue occurs with minimal physical exertion.

b. Acclimation involves two parts:

- (1) Cardiovascular adaptations: Changes that gradually lead to a lower heart rate for a given workload or intensity of exercise. This is the most rapid change during acclimation to heat.
- (2) Sweating: Sweating begins earlier with exertion; sweat rate is higher and can be sustained for longer periods of time. Sweat also becomes more dilute thus saving essential body electrolytes.

6. Preventing Heat Injury

a. All fitness professionals should recognize the following early signs of heat injury.

- (1) Confusion

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (2) Changes in mood or behavior (aggressive)
 - (3) Impaired ability to function in the environment.
 - b. Heat injury risk factors
 - (1) Cardiovascular disease
 - (2) Obesity
 - (3) Fatigue, lack of sleep
 - (4) Dehydration
 - (5) Inappropriate clothing
 - (6) Previous heat injury
 - 7. Hydration
 - a. Proper hydration is critical
 - (1) People working/exercising in heat never voluntarily drink as much water as they lose.
 - (2) We replace only about 2/3 of net water lost through thirst
- | | |
|--|--|
| | Blood flow and circulation |
| | Fat = insulation |
| | Body not at 100% |
| | Water and fluid key to cooling |
| | Rubber/plastic suits, Trash bags, etc. |
| | Once acquired, will never be back to prior level |

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (3) Educate about water consumption
- (4) Provide adequate drinking water
- (5) Two quarts per hour, a good estimate

8. Dehydration

a. Symptoms

- (1) Headache (universal symptom)
- (2) Performance decrement
- (3) Nausea
- (4) Increased core temperature

9. Heat Injury (five types)

a. Heat cramps

- (1) Symptoms
 - (a) Severe muscle cramps
 - (b) Faintness, dizziness
- (2) Treatment
 - (a) Stop exercising
 - (b) Remove the individual to a cool environment

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (c) Lay the individual on their back
 - (d) Fan the individual
 - (e) Direct cold water or apply cold compress to the groin area and armpits
- b. Heat edema
- (1) Symptoms
 - (a) Swelling in hands, etc.
 - (2) Treatment
 - (a) Stop exercising and move individual to a cool environment
 - (b) Call EMS
- c. Heat Syncope
- (1) Symptoms
 - (a) Fainting
 - (2) Treatment
 - (a) Lay individual on his/her back and treat for shock
 - (b) Make sure airway is open, raise legs about six inches off ground

cold = blanket
hot = cool down

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (c) Call EMS
- d. Heat Exhaustion
 - (1) Symptoms
 - (a) Profuse sweating
 - (b) Pale, clammy skin
 - (c) Dilated pupils
 - (d) Faintness, dizziness
 - (e) Unconsciousness
 - (2) Treatment
 - (a) Make sure that airway is open
 - (b) Lay individual on his/her side to facilitate safe vomiting
 - (c) Call EMS
- d. Heat Stroke (MOST SERIOUS)
Two types of heat stroke.
 - (1) Classic: Normally seen in elderly, chronically ill and alcoholics.
 - (a) Symptoms

Second leading cause of death in American athletes.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- 1) headache, dizziness, faintness
 - 2) weakness, confusion
 - 3) sweating is usually absent
- (2) Exertional: Usually young healthy individuals not taking medication
- (a) Sweating usually present, performing strenuous physical activity in a hot environment.
Can easily happen during a PRT in motivated individuals who don't want to quit.
 - (b) Symptoms
 - 1) Flushed hot dry skin or profuse sweating.
 - 2) Constricted pupils
 - 3) Faintness, dizziness
 - 4) Unconsciousness usually
 - (c) Treatment
 - 1) Call EMS
Irreversible brain damage or death may occur if immediate action is not taken
 - 2) Reduce heat immediately by any means available.
Dousing the body with cold water, applying cold wet
 - 3) Move victim to cool place

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

and remove as much clothing as possible.

towels, fan the individual

10. Wet-Bulb Globe Temperature (WBGT)

a. Measures the combined effects of:

- (1) Temperature
- (2) Humidity
- (3) Wind
- (4) Radiant Heat

b. MOPP gear, body armor

- (1) Adds 10 degrees to WBGT

11. WBGT Temperature Flags

a. Blue flag

- (1) 79.9 degrees or less
- (2) No Restrictions

b. Green flag

- (1) 80 - 84.9 degrees
- (2) Be alert for possible increase in index.

c. Yellow flag

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (1) 85 - 87.9 degrees
- (2) Active training curtailed for all personnel acclimated for less than 4 weeks.

d. Red flag

- (1) 88 - 89.9 degrees
- (2) Active training curtailed for all personnel acclimated for less than 12 weeks.

e. Black flag

- (1) 90 degrees or higher
- (2) All personnel will suspend and refrain from all physical training and strenuous activity.

B. Cold Injury

1. Physical Principle of Cold

a. Loss of heat to the environment

- (1) Radiation is loss of heat in the form of infrared rays.
- (2) Convection is heat transfer from the body to surrounding air.
- (3) Conduction is heat transfer from one solid

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

object to another.

(4) Evaporation of sweat from the skin results in heat loss by the body.

b. Environmental factors (natural or man-made)

(1) Temperature

(2) Wind velocity

(3) Moisture

c. Symptoms would include loss of judgement or mental reasoning, personality changes, difficulty in performing manual tasks, confusion and combativeness.

2. Types of cold injury

a. Non-freezing

(1) Trench Foot

(2) Hypothermia

(a) Exhaustion Hypothermia

(b) Immersion Hypothermia

(c) Symptoms; Loss of judgement, Mental reasoning, Changes in personality, Difficulty in performing manual tasks, Confusion, Combativeness

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

b. Freezing

(1) Frostbite

- (a) Extremities are at risk; Nose, Ears, Fingers, Toes, Penis, ETC.
- (b) Never warm tissue if the potential for refreezing exists.

3. Acclimation to the cold

a. In cold weather, the human body attempts to maintain a warm core temperature primarily by physiologic mechanisms and behavioral adaptations

- (1) Increased metabolic heat production: This occurs as the body's fuels (carbohydrates, fats and protein) are metabolized or "burned" at the cellular level. Shivering represents involuntary muscle contractions that can increase the body's metabolic rate five to six times above normal.
- (2) Peripheral Vasoconstriction: blood vessels near the surface of the skin constrict or narrow in an effort to divert warm blood away from the cool surface of the skin.
- (3) Behavioral Adaptations: A human's greatest asset in cold weather is the ability to create a warm micro-environment by wearing

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

appropriate clothing or seeking shelter.
He/ she can also increase resting metabolic
heat production by 10 times through
vigorous exercise.

- 4. Cold injury prevention
 - a. Eat frequently to maintain energy
 - b. Drink plenty of water
 - c. Avoid tobacco
 - d. Avoid alcohol
 - (1) Reduces self-protection
 - (2) Reduces shivering
 - (3) Diuretic
 - e. Clothing
 - (1) Clean and dry
 - (2) Layered, loose, and light
 - (3) Wear head protection
 - (4) Avoid restriction to extremities
 - f. Points to remember
 - (1) Body can't sense core temperature

Avoid cotton (non wicking)

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

(2) Skin acclimates itself to the cold

(3) Diuresis (cold and immersion)

(4) Avoid alcohol

C. Air Pollution can interfere with the workings of the lungs, heart, and other organs. It can aggravate asthma and other chronic lung and heart diseases. It can also weaken the lung's defenses against infection and may cause lung disease. Exercise makes us more vulnerable to health damage from these pollutants. We breathe more air during exercise or strenuous work. We draw air more deeply into the lungs. When we exercise heavily, we breathe mostly through the mouth, bypassing the body's first line of defense against pollution, the nose.

1. Problems with exercise in a polluted environment

a. Respiratory ailments interfere with normal breathing. Enhanced with exercise.

b. Carbon monoxide reduces the oxygen carrying capacity of the blood and thus affects aerobic performance.

c. Ozone and sulfur dioxide increase airway resistance. Long term exposure to ozone can decrease lung function; high heat and humidity enhance this effect.

2. Prevention of pollution-related problems

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- a. During periods of high air pollution, exercise should be curtailed
- b. Pay attention to pollution reports in the news, especially if you have respiratory problems
- c. Generally, pollution is lowest in the early morning hours before vehicles are on the road

D. High altitude

- 1. Several physiological changes occur at high altitudes (above 6500 feet)
- 2. Problems experienced during exercising
 - a. Decreased pressure of oxygen, resulting in reduced concentration of oxygen in the blood
 - b. Air is thinner so that with each breath, you take in less oxygen than you did while at sea level
 - c. To compensate, you hyperventilate (breathe more rapidly), blowing off more carbon dioxide than normal. This makes your body fluids more alkaline due to the reduced carbon dioxide in your blood.
 - d. Since the air, at high altitude, is cool and dry, considerable moisture evaporates from the respiratory passages.

(1) Hyperventilation increases this effect

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (2) Dehydration can result
- e. High-altitude sickness
 - (1) During the first few days, people often experience acute mountain sickness
 - (a) Symptoms: Loss of appetite, sleeplessness, headache, dizziness, nausea, vomiting, and generalized weakness.
 - (b) To relieve symptoms, drink lots of fluids and eat high carbohydrate meals.
 - (c) Exercise should be done with less intensity or not at all
 - (d) If symptoms do not abate within a few days, the afflicted person must return to a lower altitude.
- 3. Acclimatization to high altitude
 - a. Occurs after several weeks or even months.
 - b. Your body re-establishes its acid-base balance.
 - c. Produces more hemoglobin and more red blood cells to increase the blood's oxygen carrying capacity.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- d. There is some evidence that the acclimated individuals experience an increase in muscle capillaries and aerobic enzymes which are essential to oxygen utilization.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

SUMMARY AND REVIEW

A. State Lesson Objectives

Turn to cover page for objectives.

B. Review Major Teaching Points

Briefly summarize.

APPLICATION

None.

EVALUATION

None.

ASSIGNMENT

None.

LESSON PLAN

JANUARY 2005

COURSE TITLE: Physical Training Instructor
Training Course, P-9E-1238

TERMINAL OBJECTIVE:
Partially supported by this lesson topic:

CLASSIFICATION: Unclassified

1.0 Upon completion of this unit of instruction the Physical Training Instructor Under Training will demonstrate knowledge to instruct, demonstrate, and facilitate students in the NAVAVSCOLSCOM Physical Training Instructor (PTI) Course curriculum without injury to personnel or damage

LESSON TOPIC NUMBER: 1.11

LESSON TOPIC: Aquatics

ALLOTTED LESSON TIME: 1.0 Class

1.0 Laboratory

INSTRUCTIONAL SUPPORT:

ENABLING OBJECTIVES:
Completely supported by this lesson topic:

1 Classroom Instructor

INSTRUCTIONAL REFERENCE:

1.39 Identify and develop an aquatic fitness program
1,40 State techniques to improve swimming speed
1.41 Perform water exercises

1. Navy Swimming and Water survival Instructor's Manual CNET P-1552/16
2. Chapter 10 American Red Cross Swimming And Diving Manual
3. The W.E.T. Workout Katz/Kayz
4. Water Aerobics Berle
5. RSS Lesson 2.1
6. Remedial Lesson 1.10
- 7.

CRITERION TEST:

None

INSTRUCTIONAL AIDS:

HOMEWORK:

None

1. PowerPoint Presentation
2. Student Guide
3. Water paddles
4. Kick board

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

INTRODUCTION

A. Establish Contact

Display name and lesson topic.

1. Introduce self, give rank, current job.
2. State background, schools, duty stations, etc.
3. State question and answer policy.
4. State training time out policy.
5. Ask about medical concerns
 - a. Has anyone been to medical within the last 24 hours?
 - b. Has anyone taken any medication in the last 24 hours?
 - c. Is there any reason or medical condition that would make you unable to participate in training today?

B. State Lesson Objectives

Turn to cover page of Lesson Plan and paraphrase objectives.

C. Establish Readiness

1. Motivating statements:
State how students will use course material.

State why students need to know the lesson material.

Though you may not be a swimmer or water person you may work with someone that is.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

2. Lesson overview
 - a. Lesson Topic: Swimming for lifetime fitness
 - b. Major Teaching Points
 - (1) Benefits of aquatic exercise
 - (2) Adjusting Exercise Levels
 - (3) Components of a workout
 - (4) Phases of a fitness program
 - (5) Fitness swimming
 - (6) Stroke Length and Stroke Frequency
 - (7) Training techniques
 - (8) Open Water Swimming

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

PRESENTATION

A. Benefits of aquatic exercise

1. Prevention of cardiovascular disease
2. Cardiovascular endurance
3. Muscular strength and endurance
4. Flexibility
5. Weight management

B. Adjusting Exercise Levels

1. Frequency, Intensity, Time
2. Target Heart Rate Range
3. Rate of perceived exertion

Same principles apply

Refer to lesson guide 1.7
Principles of Training

C. Components of a Workout

1. Warm-up
 - a. Should last 5-10 minutes or about 15-20% of workout.
 - b. Can consist of slow walking, jogging, or low intensity swimming.
2. Stretching
 - a. Makes joints more flexible and improves

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

range of motion.

- b. Perform stretching during the warm up or right after it.

3. Aerobic Set

- a. To benefit from an aerobic set, you must keep your heart rate in the target range for at least 15 minutes.
- b. Aerobic set should make up 50-85% of the workout time and distance.
- c. Cardiovascular exercises include but not limited to the following

1. Walking and jogging (8 variations)

i.e.; run in place / skip in place

2. Jumping jacks (2 variations)

3. Scissors jump (2 variations)

4. Double leg lifts

5. Hopping (4 variations)

i.e.; knee's together / knee's apart

4. Muscular development set

- a. Intensity of resistance training increases directly with the size of the surface area and the speed of movement.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- b. It will seem as though you are lifting more weight if your movements are faster and the surface area larger.
- c. Using various types of equipment can help to provide greater overload. (Wearing buoyant cuffs on wrists or ankles)
- d. Equipment for resistance is not recommended for a beginner.
- e. When equipment is used. Use equipment that is specifically designed for aquatic exercises.
 - 1. Keep the body centered.
 - 2. Stabilize the trunk when lifting.
 - 3. Isolate and work one muscle group at a time
 - 4. Work major muscle groups first.
 - 5. Stop any exercises that cause sharp pain.
- f. Strength/Resistance training include but not limited to the following
 - 1. Upper body exercises
 - a. Push-Pull
 - b. Sun Gods (3 variations)
 - c. Arm raises (Front and lateral)
 - d. Dips (2 variations)

i.e.; hands in front / hands behind

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

2. Middle body exercises
 - a. Leg lifts (2 variations)
 - b. Leg lift and roll
 - c. Back float crunch
3. Lower body exercises
 - a. Standing single leg lifts
 - b. Buttocks kick (self)
 - c. Standing leg raises (side to side movement with 6 variations)

5. Cool-down

- a. Typically last 5-10 minutes or 10% of workout.
- b. Cool down activities is like warm up activities.

D. Phases Of A Fitness Program

1. Initial phase

- a. A very low intensity
- b. Build up to maintain 60% intensity for 15 minutes.
- c. Can take up to 10 weeks for this phase.

2. Improvement Phase

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- a. Begins when you can exercise 3 times a week for at least 15 minutes at a level of at least 60% intensity.
- b. Your fitness will improve by increasing frequency, intensity, or length of time.
- c. Increase duration before you increase intensity or frequency.
- d. Be sure to stay in target heart range.
- e. You will improve more rapidly in this phase than in the initial phase.

3. Maintenance Phase

- a. Begins when you reach the fitness goals that you set for yourself.
- b. Your goal is to sustain your fitness level rather than increase your workload.
- c. You might want to learn a new stroke or explore other activities to vary your program.

E. Fitness Swimming

- 1. Design your fitness swimming program carefully. Goal?
 - a. Start at the right level. Initial phase
 - b. Always use a warm-up, stretching, an aerobic set, and cool-down in each workout.

DISCUSSION POINT

- c. Include a muscular development set in two or three workouts each week.
- d. Success of your program depends on a comfortable, practical plan that you can continue the rest of your life.

RELATED INSTRUCTOR ACTIVITY

If it were not comfortable or enjoyable would a person continue with it?

F. Stroke Length and Stroke Frequency

- 1. To improve speed, two concepts are involved
 - a. Stroke length is the distance traveled in one complete cycle of the arm.
 - b. Stroke frequency is the number of complete arm cycles in a specific length of time.
- 2. Speed is the product of stroke length and stroke frequency.
- 3. To increase your speed, you need a corresponding increase in stroke length and/or stroke frequency.
- 4. You can increase speed efficiently by improving your stroke to get greater distance from each stroke while not increasing the number of cycles per second.
- 5. The stroke length may stay the same provided you increase your stroke frequency; you use more energy to reach the same speed.
- 6. The ideal is to increase speed while decreasing stroke frequency.
- 7. Can be accomplished by the wave action technique.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- a. This technique calls for the swimmer's head, arms, back, rear, and legs to lie along a straight line, streamlined. This enables the swimmer to maintain a position of least resistance. The pull is wide and is used only to move the body forward, rather than lift the body up. The arms are used primarily for sculling. The hands are turned out. During the kick, the shoulders, hips, and knees lie in a straight line. The result is that the swimmer undulates through the water, saving time and energy.

G. Training Techniques

1. Over Distance

- a. This method involves swimming long distance with moderate exertion with short or no rest period.
- b. Over distance training is used to improve your endurance.

2. Fartlek

- a. This method gets its name from the Swedish word that means "speed play" and was popularized by runners.
- b. It breaks swims into slow and fast lengths of the pool using the same stroke.
- c. Develops speed and endurance

3. Interval Sets

Principles of training

FITT

Overload

Energy systems aerobic & anaerobic

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- a. Intervals are a series of repeat swims of the same distance and time interval. They give you a specific rest period between the time spent swimming.
- b. If you swim the 50 on the 1-minute, you have 15 seconds rest before the next 50.
- c. Best all around method to develop both speed and endurance.

Example: 10 X 50 on the 1:15

4. Repetition

- a. This technique uses swim sets same distance done at close to maximum effort (up to 90 percent of maximum), but with rest periods as long or longer than your swim.
- b. Develops speed and anaerobic capacity.

5. Sprints

- a. These are short, fast swims (100 percent Effort) to simulate race conditions.
- b. Improves anaerobic capacity

6. Straight

With this set you swim a steady speed throughout the set.

7. Negative Split

This set involves swimming the second half faster

Example: If you swim 200 yards

DISCUSSION POINT

than the first half.

8. Descending Set

Often confused with the negative splitting, descending sets refer to decreasing the time on successive swims.

9. Ladders

These are several increases or decreases in distance.

10. Pyramids

Is a swim of regular increases and decreases in distance.

11. Broken Swims

- a. Are swims that are faster than your racing speed and are interrupted by a short period of rest (10 seconds)?
- b. Simulates stress conditions of competition while yielding a swimming time that may be faster than your racing time.
- c. On completion of entire swim, subtract the total time of rest from the final time to determine your swimming time.

RELATED INSTRUCTOR ACTIVITY

four times, the second 100 should be faster than the first in each set.

Example: To swim 200 four times, in a descending set, each 200 would be faster than the 200 preceding it.

Example: you swim a 25, then a 50, and finally a 75.

Example: You swim a 25, then a 50, then a 75, then a 50, and finally a 25.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

12. Dry Land Training

- a. This training technique is done out of the water to improve swimming skills.
- b. These techniques fall in two areas, flexibility and strength training.

Most coaches prefer dry land training before a swimming workout, you can do it before or after your swim, depending on your schedule.

H. Open Water Swimming

The best way to train for open water swimming is to just do it!

NOTE

Never swim alone; swim with a partner or ask the lifeguard to keep an eye on you.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

SUMMARY AND REVIEW

A. State Lesson Objectives

Turn to cover page for objectives.

B. Review Major Teaching Points

Briefly summarize.

APPLICATION

A. Tell your students that aquatic workouts are varied and should be tailored to the specific needs and skills of the student. PTI students will receive only a shallow water lab because there is no swimming level prerequisite for the PTI class. This lab will allow PTI students the opportunity to gain "first-hand" experience of a shallow water workout designed to introduce both strength and aerobic conditioning exercises.

Water Workout Safety Notes:

Minimum personnel for aquatic exercise labs: (1) Basic Swimming and Water Survival Instructor (1) Lifeguard

B. Warm-up Exercise/Stretching

1. Perform warm-up IAW reference 2, 5 or 6.

Extreme care shall be given to ensure that weak swimmers or non-swimmers do not enter deep water unless under the direct supervision of the instructor.

Ensure that students do not become overly fatigued during workouts. Over-fatigue in the water can lead to water emergencies.

The Chief of Naval Education and Training strictly forbids breath-

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

holding competitions.

Ensure that students are aware of specific TTO signals

Ensure that staff is fully aware of the Pre-mishap plan and their emergency duties.

Do not force all students to do the same workout. "Easy" workouts for good swimmers can be exhausting and dangerous for inexperienced swimmers

C. Stationary shallow water workout

1. Perform Sun Gods for 1 minute.
 - Stand in chest or shoulder deep water, feet shoulder width apart. Arms slightly below water surface.
 - Extend arms out to the side, palms facing down; push downward against the water.
 - Rotate wrist with palms facing upward and lift pushing upward against the water.
 - Extend arms in front and together palms facing each other.
 - Push arms outward against the water and then back towards the centerline.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

2. Jog in place for 1 minute.
 - Stand in chest deep water.
 - Jog in place.
3. Kick butts for 1 minute.
 - Stand in chest deep water.
 - Jog in place and bring heels to buttock.
4. Jog in place for 1 minute.
 - Stand in chest deep water.
 - Jog in place.
5. High knees for 1 minute.
 - Stand in chest deep water.
 - Jog in place and bring knees up to chest.
6. Jog in place for 1 minute.
 - Stand in chest deep water.
 - Jog in place.
7. One leg hop x 4 times each leg for 1 minute.
 - Stand in chest deep water
 - Feet shoulder width apart.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- Lift one leg up and hop on other leg.
 - Bend the leg slightly at impact.
 - Switch to other leg.
8. Run fast in place for 1 minute.
- Stand in chest deep water.
 - Run in place fast.
9. Jog in place for 1 minute.
- Stand in chest deep water.
 - Jog in place.
10. Cross-country skiers for 1 minute.
- Stand in chest deep water.
 - Extend same arm and leg forward and opposite leg and arm back.
 - In one movement extend the same side arm and leg back and move the opposite leg and arm forward.
 - Repeat
11. Gutter pushups for 1 minute.
- Stand next to the gutter and facing the wall.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- Cross ankles and place palms on the edge of the gutter.
 - Press hands downward lifting the body and extending the arms.
 - Lower the body by bending at the elbows.
 - Repeat
12. Flutter kicks for 1 minute.
- Stand next to the gutter and facing the wall.
 - Place elbows and forearms in gutter. Hands facing each other.
 - Extend feet out and back.
 - Flutter kick approximately 6 to 12 inches.
13. Gutter dips for 1 minute.
- Stand next to the gutter and facing away from the wall.
 - Place palms on edge of gutter facing away from wall.
 - Extend arms pushing down ward lifting the body.
 - Bend at the elbows, approximately 90°

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

angle, lowering the body.

- Repeat.

14. Bicycles for 1 minute.

- Stand next to the wall and facing away.
- Extend arms over and parallel to gutter.
- Place arms in gutter and support the body while extending the legs out.
- Bring one leg back towards the chest by bending at the knee to a 90° angle. Place the other leg straight out.
- Rotate by bicycling in place.

H. Shallow water work out

1. Push-ups - (10)

- Perform IAW G. 11

2. Dips - (10)

- Perform IAW G. 13

3. Running - (down and back)

- Move through the water as fast as possible.

4. Backward running - (down and back)

Ensure students do not run into

DISCUSSION POINT

- Move through the water as fast as possible.
- 5. Push-ups - (10)
 - Perform IAW G. 11
- 6. Dips - (10)
 - Perform IAW G. 13
- 7. Sideways running - (down and back)
 - Move through the water as fast as possible.

EVALUATION

A. None.

ASSIGNMENT

A. None.

RELATED INSTRUCTOR ACTIVITY

the wall or each other.

Ensure students look where they are going.

LESSON PLAN

JANUARY 2005

COURSE TITLE: Physical Training
Instructor Training
Course, P-9E-1238

CLASSIFICATION: Unclassified

LESSON TOPIC NUMBER: 1.12

LESSON TOPIC: Exercise Formula Guidelines

ALLOTTED LESSON TIME: 1.0 Classroom
1.0 Lab

INSTRUCTIONAL SUPPORT:

1 Classroom instructor

INSTRUCTIONAL REFERENCES:

1. Cooper Institute

INSTRUCTIONAL AIDS:

1. PowerPoint Presentation
2. Student Guide

TERMINAL OBJECTIVE:

Partially supported by this lesson topic:

1.0 Upon completion of this unit of instruction the Physical Training Instructor under training will demonstrate knowledge to instruct, demonstrate, and facilitate, students in the NAVAVSCOLSCOM Physical Training Instructor (PTI) Course curriculum without injury to personnel or damage to equipment.

ENABLING OBJECTIVES:

Completely supported by this lesson topic:

1.41 Identify exercise formula guidelines
1.42 Identify formula test and procedures

CRITERION TEST:

None

HOMEWORK:

None

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

INTRODUCTION

A. Establish Contact

Display name and lesson topic.

1. Introduce self, give rank, current job.
2. State background, schools, duty stations, etc.
3. State question and answer policy.

B. State Lesson Objectives

Turn to cover page of lesson plan and paraphrase objectives.

C. Establish Readiness

1. Motivating statements

Establish importance and relevance of lesson material using personal experience or anecdote.

2. Lesson overview

Briefly outline material to be covered.

a. Lesson Topic: Exercise Formula Guidelines

b. Major Teaching Points:

(1) Exercise Formula Guidelines & Assessment Tests

a. Cardiorespiratory Endurance

b. Weight Control / Body Composition

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

Measurement

- c. Flexibility / Sit and Reach
 - d. Muscular endurance /curl-up, push-up
- (2) Coding Categories for Assessment Tests
 - (3) Test procedures
 - a. Cardiorespiratory Endurance Test
 - b. Curl-up / Muscular Endurance Test
 - c. Push-up / Muscular Endurance Test
 - d. Flexibility Test
 - e. Body fat composition measurement
 - (4) Calculaton of Target Heart Rate Range
 - (5) Goal setting
 - (6) Case study packet

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

PRESENTATION

- A. Exercise Formula Guidelines / Assessment Tests
1. Aerobic Power/ Cardiorespiratory Endurance (Test 1.5 Mile Run)
 - a. Frequency - 3-5 days per week
 - b. Intensity - 60-75% of Maximum Heart Rate (MHR) for fat burning, 80% or more for interval training.
 - c. Time - 20 to 60 minutes
 - d. Type - Primary aerobic activities + interval training.
 2. Weight Control
 - a. Frequency - 3 days initially, work toward 5 days per week
 - b. Intensity - 60-75% of MHR, expend 300 cal per session.
 - c. Time - 20 minutes initially, work toward 45-60 minutes
 - d. Type - Large muscle movement, primary aerobic activities.
 3. Flexibility (Test - Sit and Reach)

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- a. Frequency - 3-7 days a week
- b. Time - Hold stretch for 15-20 seconds, increase gradually from 1-3 sets per stretch.
- c. Type - dynamic and static stretching

4. Muscular Endurance (Test - curl-ups/push-ups)

- a. Frequency - 2 to 3 days per week.
- b. Intensity - Higher repetitions, lower resistance.
- c. Time - 8-15 repetitions, 1 set initially, working toward 3 sets.
- d. Type - cover all major muscle groups by isometrics, isotonic, isokinetics. Basic workout or circuit workout.

B. Coding categories for the Assessment Tests

- 1. Outstanding - O - Above or equal to the top ten percent of people taking the test.
- 2. Excellent - E - In the top 25%, but less than Outstanding.
- 3. Good - G - Performance better than or equal to the lowest 25%, but less than Excellent.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

4. Satisfactory - S - Performance in the bottom 25%, but above the lowest 10%.
5. Unsatisfactory - U - Performance in the lowest 10%.

C. Test Procedures

1. Cardiorespiratory Endurance Test - The 1.5 mile run measures aerobic power (cardiovascular endurance). The objective in the 1.5 mile run is to cover the distance as fast as possible. Procedure for 1.5 mile run are as follows:
 - a. Participants should not eat a heavy meal or smoke for at least 2-3 hours prior to the test. Participants should warm up and stretch thoroughly prior to the test.
 - b. The participant runs 1.5 miles as fast as possible.
 - c. During the administration of the test, finish times should be called out and recorded.
 - d. Upon test completion, a mandatory cool down period is enforced. The participants should walk slowly for about 5 minutes immediately after the run to prevent venous pooling, pooling of the blood in the lower extremities which reduces the return of blood to the heart, and may cause cardiac arrhythmia.

DISCUSSION POINT

- e. Record in assessment packet
2. Muscular Endurance Test - Curl-up
- The Curl-up Test measures abdominal muscular endurance.
- a. The subject starts by lying on the back, knees bent, heels flat on the floor, with arms across chest.
 - b. Partner holds the feet down firmly.
 - c. The subject then performs as many correct curl-ups as possible in one minute.
 - d. In the up position, the individual should touch his upper thighs while keeping hands in contact with the chest or shoulders.
 - e. Lie back, touching lower edge of shoulder blades to deck. Buttocks must remain in contact with floor at all times.
 - f. Score is total number of correct curl-ups.
 - g. Breathing should be as normal as possible and making sure the subject does not hold their breath.
 - h. Neck remains in the neutral position.
3. Muscular Endurance Test - Push-up

RELATED INSTRUCTOR ACTIVITY

Refer to Student Guide Appendix A-2.

May use PRT results

Record in Student Guide Appendix A-2 Current Score.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

The Push-up Test measures upper body muscular endurance.

- a. Begin in the front-leaning rest position with hands approximately shoulder width apart and feet together (both feet on the floor). The back, buttocks and legs must be straight from head to heels and must remain so throughout the test. Feet may only be in contact with the floor, not a wall or other beneficial support surface.
- b. Lower the entire body by bending the elbows until the upper arms, shoulders and lower back are aligned and parallel to the deck.
- c. Return to the starting position by extending the elbows until the arms are straight.
- d. Repeat correctly as many times as possible in two minutes.
- e. Resting should be done only in the up position.

Record in Student Guide
Appendix A-2 Current
Score.

4. Flexibility Test - Sit and Reach

Flexibility is included in total fitness assessment because of the widespread problems of lower back pain and joint soreness. Many of these problems are related to sedentary lifestyle. It is necessary to determine the functional ability of the joints to move through a full range of motion. No general flexibility

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

test measures the flexibility of all joints; however, the sit and reach test serves as an important measure of hip and back flexibility.

- a. The subject should warm up.
- b. Sit on the deck with the legs extended, knees should remain soft. The feet should remain together with the toes pointed up. apart. Shoes are optional.
- c. The subject leans forward without lunging or bobbing and reaches slowly forward and touches the toes with the fingertips of both hands simultaneously. Do not bounce or lunge.

Record Pass/Fail in Student Guide Appendix A-2 Current Score.

5. Body Composition Measurement

Body composition is important because obesity is a risk factor for many health problems.

- a. Measure body composition IAW OPNAVINST 6110 (PTI lesson topic 13.)

5. A formula for determining weight in pounds which corresponds with body composition may be used to assist you when advising pounds vs. body composition.

- a. Subject has 25% body fat composition. Their goal is to have a body fat composition of 15%. Their weight is 200 lbs. The correct formula to determine goal body weight is:

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

(1) Goal Body Weight (lbs.) =

(% LBW now divided by % LBW goal) x current body weight

(1) Total 1.0 - .25 (% fat now) = .75 (lean wt now)

(2) Total 1.0 - .15 (fat goal) = .85 (lean goal)

(3) .75 (lean now) / .85 (lean goal) = .88

(4) .88 x 200lbs (current body wt) = 176 lbs.

D. Calculation of Target Heart Rate Range

1. Maximal Heart Rate (MHR)

a. 220 - Age = MHR

2. Multiply calculated MHR by target intensity from chart in Appendix A.

Refer to Student Guide Appendix A-3.

E. Goal Setting

1. Purpose of Goal Setting

a. Determines the participant's physical fitness status.

b. Provides information for setting achievable goals. Since goals are realistic, yet challenging, the goal-setting process enhances motivation.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- c. Goal setting puts the participants physical fitness program into operation by helping them to set realistic, yet challenging goals. It must be individualized, progressive and advancing in a step by step manner. Achieving goals will further enhance the individual's motivation.
2. Procedures for the Assessment and Goal Setting sheet.
- a. Record participant's fitness scores under the appropriate "Current Score" column, Appendix A, page A-2.
 - b. Use member's score and appropriate charts from OPNAVINST 6110 Enclosure (7) to determine current category and category range. Record score in appropriate column, Appendix A, page A-2.
 - c. Current standard scores in OPNAVINST 6110 provide a basis for setting achievable, yet challenging and quantitative goals.
 - d. Use member's score and appropriate charts from OPNAVINST 6110 Enclosure (7) to determine Goal Category. Never exceed one category when setting goals. Note length of time required to move one category: Body composition requires 12 - 16 weeks, Abdominal muscular endurance requires eight weeks, upper body muscular endurance requires eight weeks, cardiovascular

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

endurance requires 12 weeks, flexibility requires eight weeks.

- e. Record goal category and goal category range in the appropriate column in Appendix A, page A-2. Body composition and sit and reach tests will not have categories. They are designated pass or fail, within standards or not within standards.

3. Physical Fitness Assessment, Goal Setting, and Exercise Log components are:

- a. Assessment and Goal Setting
- b. Cardiorespiratory Training Program
- c. Basic Strength Training Program
- d. Endurance/Circuit Routine
- e. Stretching Log
- f. Workout Log

Instructor review each page of Appendix A, restating PTI course information pertinent to meeting set goals safely.

F. Case Study

Instructor direct students into groups and using information from the OPNAVINST 6110.1 series and the PTI course, complete a workout for Mr. Smith and/or Ms. Jones to improve their scores/body composition.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

Upon completion, discuss different workouts developed by students. Point out favorable/safe workout options and discuss any unsafe practices not in compliance with safety/standardization of OPNAVINST or the PTI course curricula.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

SUMMARY AND REVIEW

A. State Lesson Objectives

Turn to cover page for objectives.

B. Review Major Teaching Points

Briefly summarize.

APPLICATION

See presentation for application.

EVALUATION

None.

ASSIGNMENT

None.

LESSON PLAN

JANUARY 2005

COURSE TITLE: Physical Training
Instructor Training
Course,P-9E-1238

TERMINAL OBJECTIVE:
Partially supported by this lesson topic:

CLASSIFICATION: Unclassified

LESSON TOPIC NUMBER: 1.13

LESSON TOPIC: Circumference Measurements

ALLOTTED LESSON TIME: 0.5 Classroom
1.5 Laboratory

1.0 Upon completion of this unit of instruction the Physical Training Instructor Under Training will demonstrate knowledge to instruct, demonstrate, and facilitate students in the NAVAVSCOLSCOM Physical Training Instructor (PTI) Course curriculum without injury to personnel or damage to equipment.

INSTRUCTIONAL SUPPORT:

1 Classroom Instructor
1 Laboratory Instructor

ENABLING OBJECTIVES:
Completely supported by this lesson topic:

INSTRUCTIONAL REFERENCES:

1. OPNAVINST 6110.1
2. New Fitness Coordinator Exercise Leader Handbook

1.43 Identify and perform body composition determination procedures

INSTRUCTIONAL AIDS:

1. PowerPoint Presentation
2. Student Guide
3. Tape Measure
4. Yard Stick
5. Measurement Sheets
6. OPNAVINST 6110.1 Body Composition Charts

CRITERION TEST:

None

HOMEWORK:

None

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

INTRODUCTION

A. Establish Contact

Display name and lesson topic.

1. Introduce self, give rank, current job.

2. State background, schools, duty stations, etc.

3. State question and answer policy.

B. State Lesson Objectives

Turn to cover page of lesson plan and paraphrase objectives.

C. Establish Readiness

1. Motivating statements

In preparation to be a Physical Training Instructor, you may be required to perform body fat measurements.

Establish importance and relevance of lesson material using personal experience or anecdote.

2. Lesson overview

Briefly outline material to be covered.

a. Lesson Topic: Circumference Measurements

b. Major Teaching Points:

(11) Body composition Determination procedures

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

PRESENTATION

A. Body Composition Determination Procedures

1. Purpose - To gauge the effectiveness of a physical training program or the progress of individuals on a PT program.
2. Fitness and body fat program established by DOD Directive 1308.1 29 Jun 81.

B. OPNAV 6110.1

Refer to current OPNAV 6110.1.

The Instructor will read and review the chapter of the OPNAV 6110.1 on Body Composition.

C. Body Composition Measurements.

Instructor shall observe and assist students while they practice measuring body composition according to the OPNAV 6110.1

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

SUMMARY AND REVIEW

A. State Lesson Objectives

Turn to cover page for objectives.

B. Review Major Teaching Points

Briefly summarize.

APPLICATION

See Presentation for Application.

EVALUATION

None.

ASSIGNMENT

None.

LESSON PLAN

JANUARY 2005

COURSE TITLE: Physical Training
Instructor Training Course
P-9E-1238

CLASSIFICATION: Unclassified

LESSON TOPIC NUMBER: 1.14

LESSON TOPIC: Nutrition and Weight
Control

ALLOTTED LESSON TIME: 2.5 Classroom

INSTRUCTIONAL SUPPORT:

1 Classroom Instructor

INSTRUCTIONAL REFERENCES:

1. Navy Nutrition and Weight Control
Guide
2. Command Coordinator Exercise Leader
Handbook

INSTRUCTIONAL AIDS:

1. PowerPoint Presentation
2. Student Handouts
3. Food Guide Pyramid

TERMINAL OBJECTIVE:

Partially supported by this lesson topic:

- 1.0 Upon completion of this unit of
instruction the Physical Training
Instructor Under Training will
demonstrate knowledge to instruct,
demonstrate, and facilitate students
in the NAVAVSCOLSCOM Physical
Training Instructor (PTI) Course
curriculum without injury to
personnel or damage to equipment.

ENABLING OBJECTIVES:

Completely supported by this lesson topic:

- 1.44 Identify nutrients in food
- 1.45 Identify caloric values
- 1.46 Explain safety in weight control

CRITERION TEST:

None

HOMEWORK:

None

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

INTRODUCTION

A. Establish Contact

Display name and lesson topic.

1. Introduce self, give rank, current job.

2. State background, schools, duty stations, etc.

3. State question and answer policy.

B. State Lesson Objectives

Turn to cover page of lesson plan and paraphrase objectives.

C. Establish Readiness

1. Motivating statements:

In preparation to be a Physical Training Instructor, you must become confident and knowledgeable of nutrition and exercise.

Establish importance and relevance of lesson material using personal experience or anecdote.

D. Lesson overview

Briefly outline material to be covered.

a. Lesson Topic: Nutrition and Weight Control

b. Major Teaching Points:.

(1) Nutrition in Food

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (2) Healthy life style.
- (3) Safety in weight control.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

PRESENTATION

A. Nutrition is the study of nutrients and how the body uses them.

1. There are six nutrients in food: carbohydrates, protein, fat, vitamins, minerals, and water.

a. Carbohydrates (45-65% of total caloric intake)

(1) 4 cal/gm

(2) Functions

(a) Provides energy, and is the main fuel source in the body.

(3) Types

(a) Simple carbs are derived from fruits and sugars. Sugars have a lower nutritional density and are used very quickly by the body.

(b) Complex carbs have high nutritional densities and are used efficiently by the body.

(4) Glucose is the main product of carbohydrate digestion and unused portions are stored as glycogen and as fat.

Sodas, cakes, cookies low nutrition/higher calories. Fruits have a higher nutritional density.

Vegetables, grains, etc.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- b. Protein (10 -35% of total caloric intake)
 - (1) 4 cal/gm
 - (2) Functions:
 - (a) Builds and repairs tissues.
 - (b) Forms enzymes, hormones and antibodies.
 - (c) Plays structural role in all body tissue.
- c. Fat (20 - 35% of total caloric intake)
 - (1) 9 cal/gm
 - (2) Functions:
 - (a) Lines and insulates neurons (nerves) in the brain and body.
 - (b) Carrier of certain vitamins.
 - (c) Fat deposits protect and cushion the body. Insulates the body against loss of heat and protects vital organs.

Meat, eggs, fish, poultry, beans, peas, nuts, dairy products.

If not supplied in the diet, malnutrition will result.

Fat soluble vitamins A, D, E, K

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

(3) Three types of Fat

- (a) Poly-unsaturated: fish, corn, and sunflower oils.
- (b) Mono-unsaturated: Oils (olive, peanut, canola), nuts.
- (c) Saturated: Meats and dairy products, tropical oils. Solid at room temperature. Tend to raise blood cholesterol.
- (d) Saturated fat should not account for more than 10% of total fat intake for the day.

(4) Hydrogenation: A process by which liquid oils (poly or mono-unsaturated) are turned into solid fats (hydrogen is blown into the oil for stabilization). Process for making margarine and shortening.

You lose the health benefits of unsaturated fats through hydrogenation. Turns a good fat into bad.

(5) Reducing fat

- (a) Eat lean cuts of beef
- (b) Boil or bake
- (c) Avoid fried foods
- (d) Low fat milk (skim)

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

(e) Minimize use of cooking oil

(f) Reduce salad dressing

(g) Limit nuts, peanut oil

(6) Cholesterol

(a) Cholesterol should be limited to 300mg per day. Some cholesterol rich foods are liver, organ meats, egg yolks and red meats. Beware of cholesterol content of foods and adjust your diet accordingly.

d. Vitamins

(1) Organic substances found in food essential in small quantities for growth, health, and life. For example, a deficiency of vitamin C can cause scurvy; deficiencies in vitamin B1 can cause beriberi.

See hand out

(2) Functions

(a) Vision

(b) DNA formation

(c) Bone ossification

(d) Red blood cell formation

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (e) Maintenance of skin
- (f) Blood clotting
- (g) Metabolism of carbohydrates, proteins and fats

(3) Types of Vitamins

- (a) Water-soluble: B complex vitamins and vitamin C. Excesses are generally excreted in the urine but can be toxic in large amounts.
- (b) Fat soluble: Vitamins A, D, E, and K. Excesses are stored in the body tissue and is not normally excreted in urine. Overdoses can occur.
- (c) Today, true vitamin deficiencies are rare. If a person eats a varied diet from all food groups, vitamins are not needed although certain populations may require supplements (infants, pregnant women, the elderly and patients with disease.)

e. Minerals

1. The body is composed of at least 31 chemical elements, of which 24 are considered to be essential for sustaining life. They are obtained from food and water.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

2. As with vitamins, many people self-diagnose possible mineral deficiencies and take unnecessary supplements and as with vitamins, similar populations will require supplementation.
 - (a) Fluoride: infants and children
 - (b) Calcium: pregnant women and elderly
 - (c) Iron: pregnant women
3. Many health food stores market Vitamins/minerals for sale with fraudulent nutritional claims
BE CAUTIOUS!

f. Water

- (1) Water is essential for life. Our body composition is 60% water and it is the major component of blood plasma. Blood plasma is a major transportation mechanism of the body.
- (2) Water functions as a digestive medium and an absorption mechanism for nutrients. It also helps to regulate our body temperature.
- (3) Daily recommendations for adults are 2.5 liters or ten 8-oz glasses. This replacement is necessary as the body can

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

lose up to 1 quart of water as urine each day. As exercise increases, so does water loss. In the example of heavy exercise, Navy SEALs have shown 8 - 10 liters of water can be lost each day through perspiration!

- (4) Carbohydrate drinks should not be used in the place of water intake. High caloric content drinks benefit longer, endurance type exercises (triathlon, marathon) but are not generally beneficial for people trying to lose weight.

2. Calorie

- a. A calorie is a measure used to express the heat/energy value of food and physical activity.
- b. To calculate calories you must multiply grams of each component by the number of calories per gram.

- (1) Example: 8 oz. whole milk

12 gm carbohydrate + 8.6 gm fat + 8.6 gm protein.

- (2) $12 \text{ gm} \times 4 \text{ cal/gm} = 48.0 \text{ cal}$
 $8.6 \text{ gm} \times 9 \text{ cal/gm} = 77.4 \text{ cal}$
 $8.6 \text{ gm} \times 4 \text{ cal/gm} = \underline{34.0 \text{ cal}}$
159.4 cal

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

3. Alcohol
 - a. A source of calories (empty calories).
 - b. Provide 7 calories/gm, yet no nutritional value
 - c. Alcohol is easily converted to fat in the body.
 - d. Based on health risks only, the Department of Health and Human services and the Department of Agriculture have issued guidelines for moderate drinking. Following these guidelines, the drinker will reduce the chance of long term health consequences.
 - (1) They recommend that men drink no more than two drinks per day and women no more than one drink per day.
 - (2) In some instances the only guideline for safe drinking is not drinking at all.
4. Reliable sources of nutrition information
 - a. RD - Registered Dietitian
 - b. RDT - Registered Diet Technician
 - c. ADA - American Diabetes Association
 - d. SCHN - Sports and Cardiovascular Nutritionists

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- e. AHA - American Heart Association
- f. AMA - American Medical Association

B. Healthy life style

1. Carbohydrate 55-60% of diet. Protein 15% of diet.
Fat 30% or less.
2. Calculating daily caloric intake using the Basal Metabolic Rate (BMR) method:
 - a. To calculate the approximate calories used in a day it is important to determine the Basal Metabolic Rate (**BMR**) first. **BMR** is the amount of calories expended during normal physiological process at complete rest in a 24 hour period of time.
 - b. **BMR** is determined in several ways with the simplest being to determine gross or lean body weight and simply place zero (0) at the end. For example a person weighing 200 pounds would have **BMR** of 2000 calories.
 - c. Daily Caloric Requirement (**DCR**) is determined by adding additional calories to **BMR**.
 - d. These additional calories are referred to as Average Daily Activity Level

Margin of error + or -
10%

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

(**ADAL**). The more active an individual is the more calories are expended during a 24 hour period. **ADAL** range is .25 to 1.50 with a .25 representing sedentary lifestyle and 1.5 representing collegiate endurance athlete. To calculate **DCR**, multiply **BMR** by a number in this range and add that number to **BMR**. This is an approximation of calories required for a 24 hour period of time.

- e. Daily Caloric Intake (**DCI**) is the amount of calories consumed in foods and beverages daily. If **DCI** exceeds **DCR** for an extended period of time then excess calories will be converted to long term storage (fat). Remember, weight loss is a slow process. Lifestyle changes take time.
- f. Add 0 to body weight, multiply by .25 - 1.5 depending upon activity level.

Margin of error + or -10%

EXAMPLE: $150 + 0 = 1500 \times .75 = 1125$

d. ACTIVITY FACTOR

- (1) 1.3 very light physical activity

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

(sitting, standing, driving, lab work)

- (2) 1.5 light physical activity
(housecleaning, walking 3 mph)
- (3) 1.7 moderate physical activity (tennis,
weeding, walking 4 mph)
- (4) 2.0 heavy physical activity (full court
basketball, heavy digging, long
distance running)
- (5) 2.4 exceptionally heavy physical
activity (competitive triathlete,
Navy SEAL)

Example: Male 160 lbs, 71.5 inches tall, 35 years old
who is moderately physically active:

$$66 + (6.22 \times 160) + (12.7 \times 71.5) - (6.8 \times 35) = 1731 \text{ cal}$$

1731 calories x activity level factor of 1.7 = 2,942.7
calories per day

Example: Female 120 lbs, 68 inches tall, 25 years old
who is heavily active:

$$665 + (4.36 \times 120) = (4.32 \times 68) - (4.7 \times 25) = 1365 \text{ cal}$$

1365 calories x activity level of 2.4 = 3276 calories per
day

Instructor use VAP board
or powerpoint to explain
examples

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

3. Recommended Dietary Allowances (RDA's)
 - a. Set by food and nutrition board, National Academy of Sciences and National Research Council.
 - b. Designed for practically all people in the U.S.

C. Safety in weight control

1. Diet Pills. Over the counter diet pills / appetite suppressants can raise your metabolic rate, but your body tends to adapt to these drugs, so the effect may be short-lived. Besides, these drugs can have harmful side effects, including elevated heart rate and blood pressure.
2. Fad Diets. Severe caloric restriction results in lean muscle loss, loss of fluid, and lowering of the metabolism. Fad diets may work for short term weight loss, however once normal eating habits resume, the member usually returns to pre-diet body weight+.
3. Protein Powder Supplements. An unbalanced diet too high in protein can lead to dehydration,

Refer to fad diet handout

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

kidney, and liver damage.

4. Vitamin Supplements and Ergogenic aids. Members should eat a balanced diet to ensure they are getting vitamins and minerals from food sources. However, many Americans do not eat a balanced diet and a multivitamin may be beneficial to this population.
5. Steroids
6. Obesity
 - a. Currently 61% of Americans are overweight or obese.
 - b. Obesity - Defined as 20% above desirable weight.
 - c. All populations are increasing in obesity with minority women as high as 50%
 - d. Obesity can lead to:
 - (1) Diabetes and Hypertension
 - (2) Hyperlipemia and Cancer
 - (3) Cardiovascular Disease
 - (4) Sleep apnea and gout
 - e. Obesity is a very complex condition

Refer to previous chapter.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- f. Obesity is never the result of just one factor, but has many etiologies which may include:
 - (1) Genetic component
 - (2) Environmental/social lifestyle, food and inactivity
 - (3) Behavioral

D. Weight loss

- 1. What works?
 - a. Moderate calorie restriction
 - b. Regular aerobic exercise, combined with strength training
 - c. Low fat/high fiber diet
 - d. Behavioral change
- 2. Body Fat Reduction
 - a. Must include both nutrition and exercise
 - b. Nutrition
 - (1) Education
 - (2) Encourage healthy weight loss.
 - c. Exercise

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (1) Long duration, low intensity aerobic.
- (2) At least 30 min., but 45 min. is best.
- 3. Goal for weight loss.
 - a. 500 cal decrease per day = 3500 per week = 1lb. of fat.
 - b. When combined with increased activity level, provides 1-2 lbs. weight loss per week.
 - c. Self monitoring (Food/PT Log).
 - d. Calorie control
 - (1) Meal planning (Exchange System. Food Guide Pyramid.
 - (2) Encourage healthy balance of nutrients, portion control, variety and choices.
- 4. Moderate calorie restriction.
 - a. Men - 1500-1800 Cal/day.
 - b. Women - 1200-1500 Cal/day.
 - c. Calorie needs depend on height, weight and activity level.

See daily caloric requirements, tell students to note there are different formulas for determining caloric needs.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

5. What doesn't work?
 - a. Starvation or severe calorie restriction.
 - b. Will result in:
 - (1) Lean muscle loss.
 - (2) Loss of fluid.
 - (3) Lowering of metabolism.
 - c. Once eating returns, member returns to pre-diet body weight.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

SUMMARY AND REVIEW

A. State Lesson Objectives

Turn to cover page for objectives.

B. Review Major Teaching Points

Briefly summarize.

APPLICATION

None.

EVALUATION

None.

ASSIGNMENT

None.

LESSON PLAN

JANUARY 2005

COURSE TITLE: Physical Training
Instructor Training Course,
P-9E-1238

TERMINAL OBJECTIVE:

Partially supported by this lesson topic:

CLASSIFICATION: Unclassified

1.0 Upon completion of this unit of instruction the Physical Training Instructor Under Training will demonstrate knowledge to instruct, demonstrate, and facilitate students in the NAVAVSCOLSCOM Physical Training Instructor (PTI) Course curriculum without injury to personnel or damage to equipment.

LESSON TOPIC NUMBER: 1.15

LESSON TOPIC: Shipboard Training
Techniques

ALLOTTED LESSON TIME: 1.0 Classroom
.5 Lab

INSTRUCTIONAL SUPPORT:

- 1 Classroom Instructor
- 1 Laboratory Instructor

ENABLING OBJECTIVES:

Completely supported by this lesson topic:

INSTRUCTIONAL REFERENCES:

- 1. Command Fitness Coordinator Exercise Leader Handbook

- 1.47 Identify shipboard training techniques.
- 1.48 Demonstrate shipboard training techniques.

INSTRUCTIONAL AIDS:

- 1. PowerPoint Presentation
- 2. Student Guide
- 3. Exercise Bands
- 4. Cardiovascular Equipment

CRITERION TEST:

None

HOMEWORK:

None

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

INTRODUCTION

- | | |
|--|--|
| A. Establish Contact | Display name and lesson |
| 1. Introduce self, give rank, current job. | |
| 2. State background, schools, duty stations, etc. | |
| 3. State question and answer policy. | |
| B. State Lesson Objectives | Turn to cover page of lesson plan and paraphrase objectives. |
| C. Establish Readiness | |
| 1. Motivating statements | Establish importance and relevance of lesson material using personal experience or anecdote. |
| Shipboard working hours tend to be long and arduous. Cardiovascular and strength training programs can be developed for shipboard personnel. The ship shape sailor will be able to perform his job with less risk of injury and be able to pass his or her PRT. Physical fitness onboard ship requires an innovative approach. | |
| 2. Lesson overview | Briefly outline material to be covered. |
| a. Lesson Topic: | |
| b. Major Teaching Points: | |
| (1) Components of a Shipboard Routine | |

DISCUSSION POINT

- (2) Aerobic Training
- (3) Jogging
- (4) Aerobic Machines
- (5) Strength Training
- (6) Tube and Band Exercises

RELATED INSTRUCTOR ACTIVITY

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

PRESENTATION

A. COMPONENTS OF A SHIPBOARD ROUTINE

1. WARM-UP and STRETCH

Refer to Principles of Training and Beneficial and Non-beneficial Stretches and Exercises chapters for appropriate warm-up, stretching, and cool down techniques.

2. AEROBIC TRAINING

Refer to the Physical Training (lab) chapter. Workouts may be tailored according to your needs and the size of your training area.

3. JOGGING

Jog in designated jogging area. Jog at a comfortable pace; maintain a heart rate of 60%-75%. When necessary walk/jog in order to reach your distance goal. Begin by jogging for 20 minutes building up to 45 to 60 minutes, 3 times per week up to 4 times per week. A good running goal for fitness is 6 to 8 miles per week. Running more than 30 miles a week may induce knee problems. Increasing mileage too quickly can cause training injuries. Your running mileage should be gradually increased by only 10% per week.

Do not increase speed and distance simultaneously

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

4. AEROBIC MACHINES

We all love high tech aerobic machines with the flashing lights, bells, and whistles. Many people go to great lengths to boost the calorie count that flashes on the screen. They may crank up the machine going beyond their capabilities just to boost their calorie count. They end up cheating themselves or causing injury. Clenching the handrails or hugging the console, they are transferring weight from their legs to their arms or the machine. Studies show that cheaters often burn only half the calories that the machine indicates.

Use the computerized feedback to motivate you, but don't get too caught up in it. Don't rely on the numbers to validate your efforts. The number of calories you burn depends on many factors, including your weight, the amount of muscle you have, and your metabolism. The calorie figures are simply estimates.

Tune in to your body. If you start to feel faint, sharp pain, or your knee hurts, stop the exercise.

Don't ignore signs that you might be damaging muscles or joints. Always drink plenty of water.

Water and a towel will help keep you comfortable, and the more comfortable you are, the longer you will last on the machine.

(1) Treadmills

- (a) Treadmills are one of the easiest machines to use. Be sure to stay

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

focused and pay attention, or you might find yourself stumbling.

- (b) Start out slowly. Become familiar with any safety devices the machine has to offer. Always place one foot on either side of the machine and step on the belt only after you determine that it's moving at the slow set-up speed.
- (c) Don't rely on the hand rails. Hold on for balance when you first lean how to use the machine, but let go as soon as you feel comfortable. Don't forget to swing your arms when running. You move more naturally if you swing your arms. Remember when you are holding the rails you are burning fewer calories than indicated.
- (d) Look straight ahead. Your feet tend to follow your eyes, so focus on what is in front of you to help you stay in a straight line. Never turn around while running.
- (e) Expect to be disoriented. The first few times you use the treadmill, you may feel dizzy when you get off of it.
- (f) Never go barefoot. Always wear good walking or running shoes.

(2) Stationary bicycles

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (a) They give your knees a break while offering a terrific aerobic workout.
 - (b) User Tips - Set the height correctly. With the pedal in its lowest position the knees should have a slight bend. You shouldn't have to straighten or rock your hips to pedal. The knees should not feel crunched to your chest in the up position.
 - (c) Understand the display panel. Note the level you are at and the cadence. The harder it is to pedal the more lactic acid build up in the muscle. Spin faster and at an easier level to keep the workout aerobic.
 - (d) Don't pedal with your toes. Press with the balls of your foot and through your heel as you pump downward on the pedal. Pull up with the top of your foot on the upstroke. Think about making circles when pedaling. Adjust the pedal straps so that your feet feel snug.
 - (e) Don't hunch over. Rounding your back may cause back and neck pain. Use your legs for riding the bike, not your upper body. If you are using your upper body, lighten the workload.
- (3) Stair Climber
- (a) Stair-climbers have taken the place of

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

jogging up and down on bleachers. The machine eliminates most of the wear and tear on your joints.

- (b) User Tips - Rest your fingertips lightly on the bar on the front or side rails. You should be able to use the stair-climber without using the side rails.
- (c) Stand upright with a slight forward lean at the hips. A slight bend will help keep the knees from locking and enable you to go longer.
- (d) Keep your foot on the pedal. This will ensure your buttocks and thighs get a full workout and prevents you from overburdening your calf muscles.

(4) Versa-Climber

- (a) This is a total-body trainer and used by many athletes. This machine is easy on your knees. May not be good for a person with a bad back or poor circulation in their feet.
- (b) User Tips - Start with small, quick strokes for 3 to 5 minutes to warm up. Experiment with different speeds, stride lengths, and tension levels.
- (c) Practice good climbing posture. Keep your back straight and keep your torso parallel to the machine. Never extend

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

your stride or stretch where your joints lock out.

- (d) Don't become fixated on the mileage. A vertical mile is not the same as a mile on the treadmill or the road. The distance is the same but while using the versa climber, you are going straight uphill.

(5) Rowing machines

- (a) Rowing machines are great for the total body workout. Always use proper form; initiate the movement from your legs and buttocks, eliminating excess stress on the back muscles.
- (b) User Tips - Use your legs for power. Initiate the movement with your buttocks rather than your lower back. Do not lock out your knees
- (c) Pull the handle in a smooth continuous stroke. Don't stop at the most stretched out and bent positions.

Set goals and ensure your workouts are in line with your goals. Vary your workouts to keep it interesting. Perform on the hill mode to build strength, faster pace for speed, and longer, slower workouts for fat burning and overall cardiovascular endurance. You can break up your workout with 5 to 10 minute bouts on a machine with 5 minutes of weights or 5 minutes on a

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

different machine. If your goal is to build endurance, do your 20 minutes or longer consecutively. When you are aiming to burn calories and improve your health, the total time you spend exercising is what really matters.

5. STRENGTH TRAINING

- (1) Free weights are a lot more versatile than machines. Free weights work your muscles in a way that closely mimics real-life movements. Training with free weights requires more than one muscle to move, balance and steady the weight as you lift and lower it. Machines tend to isolate a particular muscle so that the rest of your muscles don't get any action.
- (2) Drawbacks to free weights while onboard ship are that they can be hard to handle during rough seas and can become a missile hazard if you lose your grip on them. As the ship rolls, forces will cause the weight to become heavier or lighter, this can cause injury. Always use a spotter onboard ship.
- (3) Weight machines do not require balance and as a rule are a lot safer onboard ships than free weights. However, the same hazard exists during rough seas, the weight will become heavier or lighter and may cause injury.

6. TUBE AND BAND EXERCISES

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (1) Tubes and bands are thick rubber tubes you can find in a medical supply store. Some exercise tubes have handles or buckles attached to each end, or they come in a kit with attachable plastic bars and door attachments. You can also buy exercise bands, which are long, flat sheets of strong rubber. You can exercise virtually every muscle group in your body with bands and tubes.
- (2) Bands and tubes take up zero space and they are portable. They provide a tool for an instant strength workout in small compartments.
- (3) Warning! If the band or tube slips, you can get snapped in the face or groin area. Tubes and bands come in different thicknesses (light, medium, heavy, and extra heavy.) It can be hard to determine when you have achieved overload without exercising with the different thicknesses of bands.
- (4) User Tips - Lift and lower the bands or tubes slowly and feel the muscle working in both directions. Don't wrap the band so tight around your palms that you cut off the circulation in your hands. When you wrap a band or tube under your feet, make sure that it's secured. Use bands or tubes that are specifically designed for exercising, inspect them frequently for worn areas.
- (5) Refer to student guide for proper technique

DISCUSSION POINT

of exercises using bands and tubes.

RELATED INSTRUCTOR ACTIVITY

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

SUMMARY AND REVIEW

A. State Lesson Objectives

Turn to cover page for Objectives.

B. Review Major Teaching Points

Briefly summarize.

APPLICATION

1. Pair Students and have them practice proper techniques on various machines IAW this lesson plan and student guide.

EVALUATION

None.

ASSIGNMENT

None.

LESSON PLAN

JANUARY 2005

COURSE TITLE: Physical Training
Instructor Training Course
P-9E-1238

TERMINAL OBJECTIVE:
Partially supported by this lesson topic:

CLASSIFICATION: Unclassified

LESSON TOPIC NUMBER: 1.16

LESSON TOPIC: Weight Training

ALLOTTED LESSON TIME: .5 Classroom
2.0 Lab

1.0 Upon completion of this unit of instruction the Physical Training Instructor Under Training will demonstrate knowledge to instruct, demonstrate, and facilitate students in the NAVAVSCOLSCOM Physical Training Instructor (PTI) Course curriculum without injury to personnel or damage to equipment.

INSTRUCTIONAL SUPPORT:

- 1 Classroom Instructor
- 1 Laboratory Instructor
- 1 Assistant Instructor

ENABLING OBJECTIVES:

Completely supported by this lesson topic:

INSTRUCTIONAL REFERENCES:

- 1. Navy Physical Conditioning Guide
30 Mar 89
- 2. Biomechanically Correct by Everett
Aaberg

- 1.49 Identify weight lifting and gym safety rules.
- 1.50 Perform warm-up exercises and stretching.
- 1.51 Demonstrate/Perform Free Weight exercise lifting techniques.
- 1.52 Demonstrate/Perform Nautilus/Resistance Equipment exercise lifting techniques.
- 1.53 Perform cool-down stretching.

INSTRUCTIONAL AIDS:

- 1. Student Guide
- 2. Workout sheets
- 3. Nautilus Equipment
- 4. Resistance Equipment
- 5. Free Weight Equipment

CRITERION TEST:

None

HOMEWORK:

None

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

INTRODUCTION

A. Establish Contact

Display name and lesson topic.

1. Introduce self, give rank, current job.
2. State background, schools, duty stations, etc.
3. State question and answer policy.
4. Describe nonverbal TTO signal
5. Ask for medical concerns:
 - a. Has anyone gone to the hospital/branch clinic for treatment within 24 hours, and are you taking any medication?
 - b. Has anyone taken over-the-counter medications within 24 hours?
 - c. Are there any potentially disqualifying illnesses/conditions for which you are currently being treated?

Nonverbal training time out maybe signaled by placing a hand horizontally over a hand held vertically forming the letter T.

B. State Lesson Objectives

Turn to cover page of lesson plan and paraphrase objectives.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

C. Establish Readiness

1. Motivating statements

In preparation to be a Physical Training Instructor, you must be knowledgeable of the differences between strength and endurance weight training and safe, effective lifting techniques.

Establish importance and relevance of lesson material using personal experience or anecdote.

2. Lesson overview

The purpose of this lesson topic is to introduce the student to the principles of weight training.

Briefly outline material to be covered.

a. Lesson Topic: Weight Training

b. Major Teaching Points:

- (1) Resistance Equipment/Nautilus Training Principles
- (2) Safety Precautions
- (3) Weight Lifting Technique Demonstration
- (4) Gym Rules

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

PRESENTATION

A. Nautilus Training Principles

1. Make certain that the rotational axis of the cam of all rotary exercises are in line with the joint axis of the body part that is being moved.
2. Position your body in a straight aligned manner. Avoid twisting or shifting your weight during the movement.
3. Maintain a loose, comfortable grip. Never squeeze the handgrip tightly as this results in elevated blood pressure.
4. Lift resistance or perform positive work to the count of two...pause...lower the resistance or perform negative work slowly and smoothly while counting to four.
5. Use as much of your range of motion as possible on each machine to develop full range strength and flexibility.
6. Breathe normally. Do not hold your breath while training.
7. Perform each exercise for 8 to 10 or 12 to 15 repetitions:
 - a. Begin with a weight you can comfortably lift 8 to 10 or 12 to 15 times.

Any exercise that blocks a joint and reduces free movement has a potential injury to that joint

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- b. Stick with that weight until you can perform 12 strict repetitions. On the following workout, increase the weight by approximately 2 to 5% which should result in your ability to perform more repetitions than the minimum guideline dictates.
 - c. Try to progress in repetitions and/or resistance in each successive workout.
8. Quickly move from machine to machine. The longer rest between machines, the less effective the cardiovascular conditioning.
 9. Follow your routine as the exercises are numbered on your workout sheet, however any time the machine you are to do next is being used, go to another exercise and then return to the machine that was in use.
 10. Move very quickly in less than 3 seconds from the primary exercise to the secondary exercise in all double Nautilus machines.
 11. Include a maximum of 12 exercises, 4 to 6 for the lower body and 6 to 8 for the upper body.
 12. Exercise the larger muscle groups first and proceed down to the smaller muscle groups. Example: hips, thighs, back, shoulders, chest, arms, and neck.
 13. Finish your entire workout in 20 to 30 minutes.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

14. Rest a minimum of 48 hours and not more than 96 hours between successive workouts (day on/day off per muscle group).

B. Safety Precautions During Weight Training

1. Safety for Nautilus

Before using nautilus machines you should:

- a. Check for frayed belts, pulleys, worn chains, and loose pads;
- b. Check for smoothness of movement of the weight rack on the guide rods;
- c. Adjust levers and seats for proper alignment and fit;
- d. Insert selector keys all the way in;
- e. Keep your hands away from the chains, belts, pulleys and cams; and
- f. **Never** place your fingers or hands between weight stacks
- g. Don't wear a weight belt while on the machine

2. Safety For Free Weights

- a. Wear proper clothing

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- b. Warm up before lifting
- c. Be cautious when moving weight plates to or from weight trees and bars. Always unload and load evenly.
- d. Always use locks on barbells and dumbbells, and be sure to insert selector keys all the way.
- e. Check equipment before using (e.g. locks on free weight bar, cables, pulleys, belts and chains on machines).
- f. Perform each exercise in the area designated for that exercise, Never perform overhead free weight exercises near someone who is sitting or lying down.
- g. Be aware of what other people are doing; be especially alert near people performing overhead exercises.
- h. Be careful of apparatus extending (e.g. seated press) and dangling (e.g. lat bar) from machine stations.
- i. Use spotters in any exercise in which you could possibly lose control. The spotter should never spot in a way which could cause injury to them or the person they are spotting. (e.g., agreeing to spot using a weight they cannot provide sufficient assistance with on bench press, squats, etc.,

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

spotting at the feet on pull ups).

- j. **Never** perform free weight exercises without a spotter when the barbell/dumbbell is
 - (1) Being lifted overhead (e.g. standing press, incline press);
 - (2) Being lifted over the face (e.g. bench press, flies-heavy, lying triceps extensions, decline bench press); or
 - (3) Placed on the back (e.g. squat, lunge, using a barbell).
 - k. Don't try to use more weight than you can Handle.
 - l. For all heavy lifts, use a rack if one is available
 - m. Return weight plates, bars, and dumbbells to their proper place.
 - n. Maintain proper form at all times during squats.
 - o. No horse play!!
3. Sequence of lifting - free weights

Note: Amount of weight is a factor

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

This sequence should be followed so that the muscle does not become too fatigued before attempting close kinetic movements.

- a. Large (multi-joint) muscle mass, close kinetic chain, complex movement. Hang cleans, squat and dead lift
- b. Large muscles (multi-joint) close kinetic chain, less complex movements. Standing military press and bend over row
- c. Open kinetic chain, movements. Lat pulls, curls, cable row
- d. Other stuff. Sit-up and pull-up

C. Nautilus Technique Demonstration

Have students go to gym. Demonstrate set-up procedures and correct form for each machine/exercise.

1. Arm cross (Nautilus)

- Adjust seat to align shoulders under the overhead axes of movement arms.
- Sit in seat and fasten seat belt.
- Place legs on leg rest and relax lower body.
- Place forearms behind movement arm pads. Grasp handles lightly.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- Push with forearms trying to touch elbows together. Keep neck back, chin down, chest up, shoulders down, and back arched. Pause in finished position, and then lower weight slowly to comfortable stretch.
- 2. Chest dip (Nautilus)
 - Perform dips with body bent forward and elbows out. Keep force on pectoral muscles.
- 3. Overhead press (Nautilus)
 - Same as military press except performed on Nautilus.
- 4. Rowing torso (Nautilus)
 - Sit with back towards weight stack. Use pads as necessary to stabilize upper body.
 - Put arms between vertical roller pads and cross forearms.
 - Bend arms in a rowing fashion as far back as possible. Pause, then return.
 - Keep arms parallel to deck at all times.
- 5. Lateral raise (Nautilus)
 - Set seat at height where shoulder joints are in line with axes of cams. Fasten seat belt.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- Pull elbows slightly to rear of your torso, inside movement arm pads. Grasp handles lightly.

- Press against movement arm pads. Raise arms a little above horizontal while simultaneously holding your shoulders down. Pause, then return to start position.

6. Multi-triceps (Nautilus)

- Position seat where elbows are slightly higher than shoulders when upper arms are resting on pad.

- Position movement arm forward to sit in machine.

- Place hands loosely on pads with palms facing each other.

- Extend both arms to forward position. Retract one arm or both arms to start position and then push pad to return to extended position keeping elbow on pad lined up with side pads.

7. Gravitron

- Select appropriate weight according to chart on machine.

- Grasp one set of the handgrip bars and place knees in slots on pad.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- Wide grip works latissimus dorsi. Middle grip works middle/lower trapezius and rhomboids. Inside grip works biceps. Lower handles work triceps or pectorals.
 - Lower and raise body using position to isolate muscle groups.
 - Pause, then return bar to start position.
8. Super pullover (Nautilus)
- Adjust seat so that shoulders are aligned with axis of rotation.
 - Fasten seat belt and press on foot lever to move elbow pads forward.
 - Place arms on the elbow pads of movement arm, and place hands on curved portion of crossbar. Keep hands open.
 - Remove feet from pedal and slowly rotate elbows up and back.
 - Rotate elbows until the bar touches midsection. Pause, keep neck muscles relaxed.
 - Return slowly to stretched position and repeat.
 - Exit machine by pressing foot pedal to support resistance while you remove elbows from the pads. Lower resistance with legs.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

9. Lower back (Nautilus)

- Sit in seat and fasten seat belt. Select weight and cross hands across chest.
- Keep hips stationary and rotate back contraction the spinal erectors.
- Pause, return to start position.

10. Multi-biceps (Nautilus)

- Sit on seat and put elbows on padded support. Seat should be placed at a height that places elbows slightly higher than shoulders.
- Pull movement arms upward and put elbows on pad aligned with axis of rotation.
- Cup hands around handles keeping wrists rigid and lower resistance until arms are straight. Do not hunch shoulders.
- Curl both arms simultaneously as far as possible. Pause, then lower resistance until arms are straight and repeat.

11. Leg extension (Nautilus)

- Sit on seat. Lean forward and place shins behind roller pad. Ensure knees are aligned with axis of rotation. Position pad behind

Has potential rotational torsion on the knee

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

back if needed.

- Push movement arm forward and upward to reach full knee extension. Pause, and lower movement arm until weight stack barely touches.

12. Leg curl (Nautilus)

Has potential rotational torsion on the knee

- Straddle movement arm, facing bench. Curl legs, pulling movement arm towards buttocks. Flex hips and pull toes toward knees as movement arm approaches vertical position.

- Pause at full knee flexion, then lower until your knees are straight.

13. Duo squat (Nautilus)

- Place both feet simultaneously on movement arm with heels placed at lower end of foot pads. Adjust seat as necessary.

- Straighten both legs simultaneously, keeping head and shoulders in secure position. Legs should stop just short of locking out.

Allow one leg to bend and bring thigh onto chest. The other leg should not move. Push out smoothly with the bent leg until the cam completely unwinds, then allow the other leg to bend and then straighten. Continue in this alternating leg fashion.

14. Hip and back (Nautilus)

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- Lay on pad and fasten seat belt. Position legs over movement arms and extend legs one at a time. Contract hamstring during extension and point toe as leg extends.

- After extension, return leg into chest.

15. Single leg hamstring curl (Nautilus)

Has potential rotational torsion on the knee

- Same form as leg curl (51) except leave one leg off bench.

16. Calf machine (Nautilus)

- Stand with pads on shoulders. Raise heels, pause and lower heels to full extension.

- Point toes in, straight, or out to isolate different parts of the calf.

D. Free Weights and Cables Technique Demonstration

Have students go to gym. Demonstrate set-up procedures and correct form for each exercise.

1. Hang Cleans

- Address the bar with feet shoulder width apart.

- Lift the bar from the floor coming to an erect standing position.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- Isometricly contract the erector muscles of the back keeping the spine in a straight and flat position.
- Bend at the hips and lower the bar to the top of the knee.
- Take a deep breath, stabilizing the back.
- Powerfully straighten the knee and hip, as the bar travel upward it should glancingly strike the mid-thigh while power-fully conducting a shoulder shrug to elevate the bar
- Quickly pull yourself under the bar, racking the bar cross the upper-anterior parts of the shoulders.
- Return to the starting position by lowering the bar and decelerating and catching the bar into the upper thigh.

NOTE: The bar should never be lowered and decelerated by the shoulders. This may result in shoulder injury.

- Lower the bar to the top of the knees and repeat.

2. Bench press.

- Lay on bench with head, shoulder blades and buttocks touching bench. Feet flat on the

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

floor so that the forearms are perpendicular to the deck.

- Grasp bar so that the forearms are perpendicular to the deck.
- Lower bar to chest at the nipples.
- Push bar up and forward in a slight arc toward the head.
- Keep resistance on muscles. Locking arms at the top will shift resistance to the skeletal system.

3. Squat

- Sit under the bar while it rests on the rack. Place the bar across the back of the shoulders just below the neck.
- Place the hip under the bar, isometricly contract the back and lift the bar upward off the rack.
- With the aid of the spotter step back and clear off the rack.

Set-up for performing the squat:

- Position feet flat on the deck between hip and shoulder width apart, toes outward 15-30 degrees, head and shoulder straight ahead eye level and looking to a distant point.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- Once set bend at the knees and hip, lowering the body until the top of the thighs are parallel to the deck. Raise the body to the starting position.
- Keep the back isometricly contracted. The back should never bow.
- No bouncing at the bottom, the lift should be smooth, controlled and calculated.

4. Dead lift

Alternate

- Address the bar with feet shoulder width apart.
- Grasp the bar with grip wider than knee portion, palms to the back.
- Bend at the hip and knees lowering the butt. Arms should remain straight, shoulders pulled back and ahead of the bar.
- Back should be isometricly contracted, flat and at approximately 45 degree to the deck.
- Begin by pressing the feet into the floor maintaining the back in a constant position and angle.
- Pull begins as the bar clears the knees, while continuing to push with the legs. Straighten the back until standing completely erect, (legs and back erect) pull the

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

shoulders back.

- Decelerate the bar to the ground by doing the lift in reverse. Note: Do not allow the back to bow. Control the bar all the way to the floor.
- Relax and re-address the bar.

5. Military press

- Stand with feet hip width apart. Bar should be resting on the rack. Grasp bar with a grip so that the fore arms are perpendicular to the deck.
- Rest the bar on the anterior shoulder/upper chest.
- Press bar straight up to extended position, keep the chin tucked to avoid striking the bottom of the chin.

Note: Avoid bowing the back. Back should remain straight and isometricly contracted for stability.

- Lower the bar to chest smoothly and controlled.

6. Bent over Row (Olympic bar)

- Stand feet shoulder width apart

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- Bend at the knee and forward at the hips so the torso is at a 45 degree angle with the deck (slight forward lean).
- Arms should hang so that the bar does not hit the knees.
- Pull the bar to the bottom of the chest and return under control.
- Pause, return weights to start position.

7. Standing dumbbell curl

- Stand holding dumbbells by thigh, arms extended while flexing the elbow rotate the forearm so the lift finishes palm up.
- Lower dumbbells to start position smoothly and controlled..
- Dumbbells may be raised one at a time or both at the same time.

8. Bent knee sit up

- Lay on back with knees bent. Arm crossed across chest and raise body until both elbows touch thighs.
- Lower body to start position.

9. Lat pull down

- In seated position, grasp bar with wide grip.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

Pull bar down to chest as in a pull- up and return to the starting position, fully extended.

10. Triceps press down

- With thumbs on top of straight bar or V-shaped bar, press bar down extending triceps while keeping upper arm stationary and against the side of the torso.
- The cable should pass directly in front of the face. Avoid allowing the cable to pass on either side of the head.

11. Two hand cable row

- Seated, with knees slightly bent, reach to grab cable bar with both hands
- Pull cable bar toward bottom of rib cage. While squeezing the shoulder blades.
- Extend the arms out again together smoothly and controlled.
- Upper body should be erect with little or no forward and backward rocking at the hips.

12. Pull up

- Grasp pull up bar with hands wider than shoulder width, palms away.
- Pull body to bar with bar in front of the

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

head. Do not hunch back at top but remain erect. Smooth and controlled, return to start position. Don't drop, return under control

13. ¼ Sit up

- Lay on back with legs in air, thighs perpendicular to the deck. Arms crossed across the chest. Curl up raising body toward ceiling.
- Lower body to start position.

E. Gym Rules

1. Weights will be racked upon the completion of each exercise.
2. Olympic weights will be removed from the bars and place on the appropriate weight tree when the exercise is completed.
3. Weight belts should be avoided. Proper lifting should be taught. Weight belts set up a false contraction point and weaken the erector muscles of the back, predisposing the athlete to muscle injury of the back.
4. Weights will not be banged together or damaged through misuse.
5. Foul language will not be tolerated.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

6. Personal radio will be used with head phones.
 7. Towels will be used to clean/dry areas of common body contact as a sanitary precaution.
- F. Instructor may utilize handouts, any workout from LP 1.13, or allow students to select their own exercises from this lesson plan. Students shall:
1. Perform warm up and stretching exercises IAW LP 1.5.
 2. Perform weight training workout.
 3. Perform cool down exercises IAW LP 1.5.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

SUMMARY AND REVIEW

A. State Lesson Objectives

Turn to cover page for objectives.

B. Review Major Teaching Points

Briefly summarize.

APPLICATION

See Presentation for Application.

EVALUATION

None.

ASSIGNMENT

None.

LESSON PLAN

JANUARY 2005

COURSE TITLE: Physical Training
Instructor Training Course
P-9E-1238

CLASSIFICATION: Unclassified

LESSON TOPIC NUMBER: 1.17

LESSON TOPIC: Physical Training

ALLOTTED LESSON TIME: 2.0 Laboratory

INSTRUCTIONAL SUPPORT:

- 1 Laboratory Instructor
- 1 Assistant Instructor
- 1 Lifeguard

INSTRUCTIONAL REFERENCES:

- 1. New Fitness Coordinator Exercise Leader Handbook
- 2. Naval Special Warfare Calisthenics
- 3. Navy Swimming and Water survival Instructor's Manual CNET P-1552/16
- 4. Red Cross Swimming and Diving
- 5. RSS Lesson 2.1
- 6. Remedial Lesson 1.10

TERMINAL OBJECTIVE:

Partially supported by this lesson topic:

- 1.0 Upon completion of this unit of instruction the Physical Training Instructor Under Training will demonstrate knowledge to instruct, demonstrate, and facilitate students in the NAVAVSCOLSCOM Physical Training Instructor (PTI) Course curriculum without injury to personnel or damage to equipment.

ENABLING OBJECTIVES:

Partially supported by this lesson topic:

- 1.54 Comply with safety procedures while exercising.
- 1.55 Perform warm up exercises/ stretching.
- 1.56 Perform Physical Training conditioning program.
- 1.57 Perform cool-down stretching

CRITERION TEST:

None

HOMEWORK:

None

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

INSTRUCTIONAL AIDS:

1. Stop watch
2. Whistle
3. Station plaques
4. Amplifier speakers
5. Remote microphone headset
6. Stereo Cassette/CD player
7. Airboxing CD/Tape
8. Circuit Training Equipment
9. Water Aerobics Equipment

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

INTRODUCTION

A. Establish Contact

Display name and lesson topic.

1. Introduce self, give rank, current job.
2. State background, schools, duty stations, etc.
3. State question and answer policy.
4. Describe nonverbal TTO signal.

Nonverbal training time out may be signaled by placing a hand horizontally over a hand held vertically forming the letter "T".

5. Ask for medical concerns:

- a. Has anyone gone to the hospital/branch clinic for treatment within 24 hours, and are you taking any medication?
- b. Has anyone taken over-the-counter medications within 24 hours?
- c. Are there any potentially disqualifying illnesses/conditions for which you are currently being treated?

B. State Lesson Objectives

Turn to cover page of lesson plan and paraphrase objectives.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

C. Establish Readiness

1. Motivating statements

Establish importance and relevance of lesson material using personal experience or anecdote.

2. Lesson overview

Briefly outline material to be covered.

a. Lesson Topic: Physical Training (aerobic)

b. Major Teaching Points:

- (1) Safety in Exercising
- (2) Warm-up Exercising/Stretching
- (3) Exercise Techniques
- (4) Interval Training
- (5) Calisthenics
- (6) Station Training
- (7) Running
- (8) Obstacle Course
- (9) Sprints
- (10) Abdomen / Lower Body Workout

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (11) Airboxing Conditioning Workout
- (12) Stationary Shallow Water Workout
- (13) Shallow Water Workout
- (14) Cool-down Stretching

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

PRESENTATION

A. Safety in Exercising

1. Hydrate before and after exercising.
2. Maintain proper form.
3. Don't hold your breath during exercise.
4. Don't work out if you're ill.
5. When performing high impact exercises, ensure you land with knees slightly bent "soft".
6. Balance out hip flexor exercises with hip extensor exercises to keep muscle balance.
7. When performing exercises where the knee extends out in front of your body, ensure the knees do not extend past the toes.

Instructor will ensure students take head/call water break after warm-up, between options (if more than one) and before cool down. Briefly reiterate main safety points from previous chapters.

B. Explain/Demonstrate Warm-up Exercising/Stretching

1. Slow jogging or running in place - 1.5 minutes of easy jogging (three laps around basketball court)
Purpose: warm-up and conditioning
2. Four-Count jumping jacks - 15 repetitions.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

Purpose: Warm-up and conditioning

- a. From a standing position:
- b. Ready, stand with arms at side (begin).
- c. One, raise arms overhead relatively straight. Feet slightly wider than shoulder width and knees slightly bent. Knees should flex in both positions.
- d. Two, return to the ready position.
- e. Three, same as one.
- f. Four, is not sounded, (count repetitions).

3. Four count bicycle crunches - 10 repetitions.

Purpose: Warm-up and abdominal strength/conditioning

- a. From a lying position on back:
- b. Fingers placed at side of head, supporting head. Legs shall be straight and feet six inches off the ground. Bring one knee towards the chest and the opposite elbow up to touch it this is "one"
- c. Return to the starting position and repeat with the opposite leg and elbow, this is count of two.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- d. As you alternate elbow to knee, count "three" and "four."

4. Bent-knee push-ups - 15 repetitions

Purpose: Warm-up and chest/arm strength/conditioning

- a. From a lying position on the stomach:
- b. "Ready" on hands and knees with the arms straight.
- c. "Down", Lower body toward ground until upper arm is parallel with ground.
- d. Return to starting position, count repetitions.

5. Side to Side stretch

Purpose: Stretch the latissimus dorsi

- a. From a standing position:
- b. Stand with feet shoulders width apart. Extend the left arm straight up and grasp the left wrist with the right hand. Slowly lean to the right without bending forward at the waist.
- c. Repeat in the opposite direction.

6. Tricep stretch

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

Purpose: Stretch the back of the arm muscle
(Tricep Brachii)

- a. From a standing position:
- b. Touch the left shoulder blade with the left hand and press gently backwards on the left elbow with the right hand.
- c. Repeat for the right arm.

7. Chest stretch

Purpose: Stretch for the chest.

- a. From a standing position:
- b. Extend arms to the side at shoulder level.
- c. Keeping thumbs pointed up, extend arms backward.
- d. Either have another person hold the stretch or use a pole for resistance.

8. Posterior shoulder stretch

Purpose: Stretch for the posterior shoulder.

- a. From a standing position:
- b. Reach the right arm straight out and across the chest.
- c. With the left hand, grasp the right arm just

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

above the elbow.

- d. Gently pull right arm across the body.
- e. Repeat for other shoulder.

9. Trunk twist (seated)

Purpose: Stretch for the trunk.

- a. From a seated position:
- b. Clasp both hands in front of the chest, twist the upper torso to one side and hold for 10 seconds.
- c. Repeat to opposite side.

10. Inside hurdler

Purpose: Stretch for the hamstrings.

- a. From a seated position:
- b. Extend left leg with toes pointing straight up. Bend the right leg until the sole of the right foot is touching the inside of the left knee. Bend forward at the waist, taking chest toward left knee.
- d. Repeat for the right leg.

11. Groin stretch

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RELATED INSTRUCTOR ACTIVITY

Purpose: Stretch for the groin area.

- a. From a seated position:
- b. While sitting with the soles of the feet together and back straight, grasp both ankles and pull them as close to the body as possible. Gently relax the musculature of the inner thigh, allowing the weight of the knees to stretch the muscles. If more pressure is needed, use your elbows to supply a gently pressure, downward on the knees.

12. BUD/S knee (ITB)

Purpose: Stretch for the iliotibial band.

- a. From a seated position:
- b. Stretch left leg straight out or flat on the deck.
- c. Hook right foot over left leg, near the knee.
- d. Gently twist trunk to the right.
- e. Repeat to left.

13. Ankle rotation

Purpose: Dynamic stretch for the ankles.

- a. From the seated position:
- b. Bend and bring the right ankle over the left

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RELATED INSTRUCTOR ACTIVITY

thigh.

- c. Hold right ankle with right hand, lifting it above the left thigh.
- d. With the left hand, rotate the right ankle clockwise and counter clockwise.
- e. Repeat for other ankle.

14. Quadriceps stretch

Purpose: Stretch for the quadriceps.

- a. From a standing position or lying on the stomach:
- b. Bend the left leg and grasp the left ankle with the left hand. Pull the foot toward buttocks, keeping the knees together.
- c. Repeat, for the right leg.

15. Lower back stretch (one or two legs)

Purpose: Stretch for the lower back.

- a. From a lying position on the back:
- b. Lying on back, curl both knees up to chest while placing hands in the bend behind the respective knee. Hold knees to chest with hands, relaxing back muscles.

SAFETY NOTE

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

If pain is felt, STOP stretching at once, and let the Primary Instructor know.

16. Abdominal stretch

Purpose: Stretch the stomach (Rectus Abdominis).

- a. From a lying position on the stomach:
- b. Push up onto elbows while leaving the hips on the deck. Pull up tall from the waist.

17. Calf stretch

Purpose: Stretch the calves (Gastrocnemius) and Achilles tendons.

- a. From a standing position, next to a wall or stationary object:
- b. Stand facing the wall approximately four feet away. Lean against the wall, bring the right leg forward while keeping the left leg extended and left heel flat on the deck.
- c. After calf stretch, bend the left knee and shift weight forward to stretch Achilles tendon.
- d. Repeat, a. and b. for the right leg.
- e. Now stretch with both legs extended, heels flat on the deck.

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18. Achilles tendon stretch

Purpose: Achilles tendon stretch.

- a. From the standing position with hands on hips:
- b. Stand with feet shoulder width apart and step forward approximately 6 inches with one foot.
- c. Sit back over back heel and slightly bend knees, keeping back heel on the ground.

C. Cardiovascular/Muscular Endurance Exercises. The following exercises are utilized in the cardiovascular exercise options. Ensuring proper form is an important factor in injury prevention. The instructor should explain and demonstrate exercises used in the physical training session prior to leading students in any exercises. Select number of exercises/options depending upon the fitness level of the class.

1. Side Straddle Hop / $\frac{1}{4}$ side straddle hop

Description: This is a four-count exercise. Begin from a standing position with feet together and hands at sides. On the first count, jump up while bringing hands together over the head and landing with feet apart. On the second count, jump back to toe starting position. The third count repeats the action performed during the first count, and on the fourth count return to the starting position.

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a. ¼ side straddle hop - with arms bent at elbows, bring arms up level to shoulders only.

Purpose: Cardiovascular exercise.

2. Sun Gods (Air Circles)

Description: Extend the arms out and to the sides, elbows slightly bent. Move arms in small circles.

Purpose: Endurance exercise for the shoulder muscles.

3. Push-Ups (Wide, Standard, and Narrow)

Description: This is a two-count exercise. Begin lying on the stomach with hands and feet on the deck, arms extended, and the head facing forward. On the first count, bend the elbows to at least a 90° angle, lowering the chest toward the deck. On the second count, extend the arms back to the starting position.

Purpose: Conditioning exercises which primarily incorporate chest and anterior shoulder muscles, secondarily incorporate the triceps and abdominal muscles.

Note: These exercises should be performed first with the hands placed wider apart than shoulder width (wide push-ups), then gradually move the hands closer together so the smaller muscles (i.e., triceps) are worked last. Starting wide

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circumvents the problems of fatiguing the triceps prior to fatiguing the pectorals.

4. Obliques sit-ups (right and left)

Description: Begin by lying on the back with the hands clasped behind the head. Legs can be either bent at the knees with feet on the deck or bent with the knees toward the chest (feet elevated from the deck), or with one leg crossed over the knee of the opposite leg. Slowly lift and twist the torso, bring one shoulder toward the knee of the opposite leg. Return to starting position. Perform exercise on both sides.

Purpose: Conditioning exercise for the abdominal and oblique.

5. Eight Count Body Builders

Description: This is an eight-count exercise that starts from a standing position.

On the first count, bend the legs and place the hands on the deck.

On the second count, extend both the legs back supporting the body weight with the extended arms (push-up position).

On the third count, bend the elbows, lowering the chest toward the deck.

On the fourth count, extend the arms.

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On the fifth count, separate the legs while keeping the arms extended.

On the sixth count, bring the legs back together as they were on the fourth count.

On the seventh count, flex the legs and bring them back to the first-count position.

On the eighth count, return to the starting position.

Purpose: Conditioning exercise which primarily incorporates chest, anterior shoulder, and leg muscles, secondarily incorporates triceps, abdominals. Cardiovascular conditioning exercise.

6. Prone back extension

Description: Lying face down on the deck, hands clasped behind the back, lift the upper torso off the deck, hold, and return to starting position.

Purpose: Conditioning exercise for the back and hip extensors.

Note:

- (a) Avoid hypertension of the back.
- (b) Placement of the hands alters the difficulty.
 - 1) Behind the back - easiest

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- 2) Behind the head - more difficult
- 3) Straight out in front is the most difficult.

7. Hip Rollers

Description: Lying on your back with legs bent and elevated off the deck, slowly bring both knees down together on one side until the lower back begins to lift off the deck. Bring the knees back to the starting position, then repeat on the other side.

Purpose: Conditioning exercise for abdomen.

8. One / Two Legged squat

Description: Using one or both legs to support the body weight, bend until the thigh is almost parallel to ground and return to starting position. If one legged - repeat using the other leg.

Purpose: Conditioning exercise for the hip and thigh muscles.

NOTE:

This exercise is good when equipment and/or weights are unavailable. Squat exercise should be performed with the upper portion of the legs parallel to the ground. Squatting lower places excessive stress on the knee. Knees should never extend beyond toes when in squat position.

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9. The Superman (prone or kneeling)

Description: This exercise can be performed either lying on the stomach or on the hands and knees. The opposite arm and leg (i.e., right arm, left leg) should be lifted and held for 3 to 5 seconds, then slowly lowered. The same movements should then be made with the other arm and opposite leg.

Purpose: Conditioning exercise for the back muscles and hip extensors.

NOTE:

This exercise helps develop balanced strength between the hip flexors and extensors. It is very safe, and although it may look easy, it can burn after a period of time. Adding weight to the arms and legs makes the Superman more difficult. Avoid hypertension of the back, the leg should not be raised higher than the hip when in the kneeling position.

10. Dive Bomber Push-Ups

Description: This is a two-count exercise. Start by on the stomach with the feet spread approximately 3 feet apart, hands on the deck, elbows fully extended, and hips slightly lifted. On the first count, the upper torso sweeps down toward the deck between and through the hand while bending the elbows. The resting position is the down position of a basic push-up. On the second

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count, the upper torso sweeps back and up while the elbows extend to return starting position.

Purpose: Conditioning exercise for the forearms, chest, anterior deltoids, and triceps.

11. Stomach Pump-Ups

Description: Begin by lying on the back with knees bent, feet on the deck, and hands on hips. Then lift and lower the upper torso.

Purpose: Conditioning exercise for the abdominal and hip flexors.

NOTE:

Limit the use of this exercise. Keeping the mid to low back on the ground prevents engagement of the hip flexors.

12. Good Morning Darling

Description: This is a four-count exercise. Start by lying on the back, with hands under the hips, legs extended, and feet together, 6 inches above the deck. On the first count, spread the legs 2 to 3 feet apart. On the second count, bring the legs back together. The third count repeats the first position. On the fourth count, the legs come back together.

Purpose: Conditioning exercise for the abdominal and hip flexors.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

NOTE:

Limit the use of this exercise. This exercise has potential for injury to the discs and lower back, always maintain proper technique.

13. Dirty Dogs

Description: On hand and knees, keeping the legs bent, lift one leg, knee pointing outward, to the end of range of motion. Switch to the other leg.

Purpose: Conditioning exercise for the hip/thigh abductors.

14. Leg Levers

Description: Lying on the back with arms under and supporting the lower back, slowly left leg approximately 2 feet off the deck right leg is kept on deck, and lowered down again. Repeat with right leg approximately 2 feet off the deck and left leg on deck.

Purpose: Conditioning for the abdominals and hip flexors.

15. Donkey Kicks

Descriptions: On hands and knees, extend one leg out behind, then bring it back. For the count or time limit, then the opposite leg.

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Purpose: Conditioning exercise for the hip extensors.

NOTE:

This exercise may be combined with Dirty Dogs. The same leg would be lifted to the side and returned, then extended behind and returned. **To avoid hypertension of the back the leg should not be raised higher than the hip.**

16. Flutter Kicks

Description: This is a four-count exercise. Start by lying on the back, with hands under the hips supporting the lower back, legs extended, and feet together, 6 inches above the deck. On the first count lift the right about 1-1/2 feet, keeping the left leg straight. On the second count, lift the left leg to same position while returning the right leg to starting position. Third count, bring the right leg back up, while returning the left leg to starting position. Fourth-count, shift legs once more.

Purpose: Conditioning exercise for the abdominal and hip flexors.

NOTE:

Limit the use of this exercise and maintain proper technique.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

17. Prone Flutter Kicks

Description: This exercise is the Flutter Kick performed lying on stomach.

Purpose: Conditioning exercise for the back and hip extensors.

NOTE:

Avoid Hyperextension of the back. Exercises that work the hip extensors are highly recommended because they help balance out the hip flexor conditioning.

18. Crunches

Description: Lying on the back with legs bent and elevated off the deck, either place the hands behind the neck or cross the arms on the chest. Lift the upper torso 10 to 12 inches off the ground and then return to the starting position.

Purpose: Conditioning exercise for the abdominal.

NOTE:

There are many variations to this exercise. For example, the legs may be bent with feet on the deck, bent with knees towards the chest and feet elevated, or extended vertically. The arms also may be placed in several positions including alongside the body (easiest), across the chest (easy) hands behind the head (difficult), or hands clasped above the head (most difficult).

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19. Side to Side hop (downhill ski)

Description: Standing with feet together and slightly bent. Jump from side to side keeping the feet together and bending at the knees absorbing the shock.

Purpose: Conditioning exercise for the legs and cardiovascular system.

20. Cross-country Skier

Description: Standing with feet together and hands to the side. Extend right hand and simultaneously move left foot back approximately 12 inches. Repeat with other hand and foot. Continue mimicking a cross-country skier.

Purpose: Conditioning exercise for the hip extensors, legs and cardiovascular system.

21. Rope Climb

Description: Ascend the rope using both hands and feet. A hand-over-hand method of climb should be used. The feet are employed by wrapping a leg around the rope along with pushing the feet together with the rope in between. After descending the rope, the student shall repeat the exercise.

Purpose: Conditioning exercise for upper body strength.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

22. Rope Skip and Rope Hop

Description: Grab the handles of the rope. Throw the rope over head and skip rope alternating legs or hop rope landing on both feet at one time.

Remember to land with knees slightly bent "soft".

Purpose: Conditioning exercise for the cardiovascular system.

23. Versa Climber

Description: Place feet in feet holder, grab handles with hands. Move feet up and down at a fast pace with arms movement following.

Purpose: Conditioning exercise for the cardiovascular system.

24. Bicycle Crunches

Description: Lie on back with fingers placed at side of head, supporting head. Legs shall be straight and feet six inches off the ground. Bring one knee towards the chest and the opposite elbow up to touch it then return to the starting position and repeat with the opposite leg and elbow. Repeat this until time is expired.

Purpose: Primary conditioning exercise for the abdomen and secondary exercises the hip flexors.

25. Hand Walks

Description: This exercise is performed on the parallel bars. The student will start at full arm

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extension on the bars and keeping the arms fully extended, travel from one end of the bar to the other. Jump down and repeat.

Purpose: Conditioning exercise for the chest, shoulders, forearms and triceps.

26. Dips

Description: Dips will be performed utilizing a bench and the platform at the north end of the gym. Start by sitting on the edge of the platform with the legs extended and resting on the bench. With the hands on the platform, lower the body as far as possible, then extend arms back to full extension.

Purpose: Conditioning exercise for the chest, anterior and medial shoulders, triceps.

27. Pull-ups

Description: Pull-ups will be performed on the pull-up bars at the south end of the gym. Palms forward, full arm hang; pull-up until chin passes over the bar, then return to full arm hang position. Repeat. (NO kicking of feet allowed).

Purpose: Conditioning exercise for the back, posterior deltoids, and biceps.

Note: If personnel needs assistance, spotter should always provide support at the waist area, DO NOT hold feet.

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RELATED INSTRUCTOR ACTIVITY

28. Situps and ¼ situps

Start by lying flat on their back with knees bent, heels about 10 inches from buttocks. Arms shall be folded across and touching the chest, with hands touching upper chest or shoulders. Feet shall be held to floor only by partner's hands. Curl body up, touching elbows to thighs while keeping hands in contact with the chest or shoulders. After touching elbows to thighs, the student lies back, touching lower edge of shoulder blades to deck. On ¼ situps, body is only raised to ¼ degree rather than upright and hands may be placed on the thighs or across the chest with or without feet being held by a partner.

Purpose: Conditioning exercise primarily for the abdominals, hip flexors, and secondarily the quadriceps.

29. Bicep curls

With weight or without, make hands into fist. Palms down by sides facing in toward the body, slowly bend elbow, raising and rotating the fist until it is facing the anterior shoulder. Attempt to lift the weight slowly, do not use the momentum of the movement to lift the weight. The elbow should remain close to the side.

Purpose: Conditioning exercise for the biceps.

D. The instructor may select more than one option depending upon the fitness level of the class. Select from the following workout options:

Check flag conditions if conducting exercises outside.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

INTERVAL TRAINING OPTION

1. Interval training is based upon proven scientific methods. These methods allow a person to improve their aerobic or anaerobic fitness performance. Intervals contain an exercise followed by a rest period. Intervals may be modified in frequency, intensity, and time. Adjustments can be made to specifically meet the athlete's requirements and goals. Longer intervals (880+) improve endurance and time and engage the Slow Oxidative (SO) fibers (primary) and the fast twitch Fast Oxidative Glycolytic (FOG) fibers (secondary). Medium intervals (440) improve speed and engage both types of fast twitch fibers: the FOG (primary) and and Fast Glycogenolytic (FG) (secondary) fibers. Shorter intervals (220-) improve speed and engage the fast twitch FG (primary) and FOB (secondary) fibers. To prescribe interval training, ensure the athlete has a good cardiovascular base (endurance/time) before they begin training for speed. The instructor must also determine the athlete's "standard". To determine their standard, they must run their best time at whichever distance they are training for.
2. Intervals permit high intensity exercises for a relatively long period of time, i.e., not many people can maintain a 4 minute mile pace for an entire mile. Most people can maintain four 15 second bursts at a 4-minute mile pace with rest periods in between the 15-second run.
3. To determine run/rest ratios the following formulas may be used:

Higher intensity = higher rest!

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- | | | |
|----|--|---|
| a. | For shorter, high intensity anaerobic exercise using FG/FOG fibers the run/rest ratio is 1:3. A one-minute interval would be followed by three minutes of rest. | 220 or shorter |
| b. | For high/medium intensity anaerobic exercise using FOG/FG fibers, the run/rest ratio is 1:2. A two-minute interval would be followed by four minutes of rest. | 440 |
| c. | For lower intensity aerobic exercise using both SO and FOG fibers, the run/rest ratio is 1:1.5. A six-minute interval would be followed by nine minutes of rest. | 880 or longer |
| 4. | Interval training should not account for more than 10% of your total mileage per week. If you run 10 miles a week, interval training should not account for more than one mile. | You must be realistic about the student's fitness level and goals. Adjust workouts accordingly. |
| 5. | Examples: | |
| a. | Example: A student wishes to improve his speed on the 220, ½ a lap. The student runs his fastest 220 at 50 seconds. Therefore his standard is 50 seconds. He can not run faster than his fastest time. He will run 220 intervals at a rate slightly slower (3-5 seconds) than his fastest time: 53-55 seconds per 220 with 2:45 seconds of rest between intervals. | FG/FOG Fibers Anaerobic Rest Ratio 1:3 |
| b. | Example: An 8-minute mile can be broken down | FOG/FG Fibers Anaerobic |

DISCUSSION POINT

into intervals of four 440s. This is one lap around a normal high school track. When divided, these 440s should take 2 minutes each. When running these 440s each 440 should be run 1-4 seconds faster than the divided two minutes, one 440/lap should be run at 1:56 with a rest of 3:52. After 4-6 weeks, the student's best mile should drop by a few seconds.

- c. Example: An 8-minute mile can be broken down into two 880 yard intervals. You would add 8 seconds to the 880 yard interval, giving you a time of 4:08 per 880. Your rest period would be 6:12.

6. Instructor determine which interval - 880/440 the class will run.
- (1) Determine students' best mile. Instruct students to run best mile.
 - (2) Call out students' $\frac{1}{4}$ (440) mile times and insure students remember finish time.
 - (3) Determine students' interval and rest time period using formulas from above.

CALISTHENICS OPTION

1. Each exercise will be for a minimum of 30 seconds with a ten-second transition period between exercises.

RELATED INSTRUCTOR ACTIVITY

Rest ratio 1:2

SO/FOG Fibers Aerobic
Rest ratio 1:1.5

Muster on running track

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

2. At the discretion of the instructor and depending on the fitness level of the class, the order of and the number of calisthenics may be change
 - a. Running in place (slow)
 - b. Side straddle hop
 - c. Squats (2 Leg)
 - d. Superman
 - e. Skip rope
 - f. Sun gods
 - g. Push-ups
 - h. Oblique sit-ups (R)
 - i. Oblique sit-ups (L)
 - j. One leg squat (R)
 - k. One leg squat (L)
 - l. Dive bomber push-up
 - m. Lunges
 - n. Hip rollers
 - o. Crunches
 - p. Run (slow to fast)
 - q. Side to side hop
 - r. Run (push arms up)
 - s. Bicycle crunches
 - t. Dirty Dogs
 - u. Jumps (soft knees)
 - v. Cross country skier
 - w. Run (slow down)

STATION TRAINING

1. Instructor shall place station plaques in a circular pattern. Instructor can change the order of the stations and alternate stations can be used

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

with a large class.

- a. Rope climb
- b. Rope skip
- c. 8 count body builders
- d. Versaclimber
- e. Obliques (R)
- f. Obliques (L)
- g. Bicycle crunches
- h. Jumping jacks
- i. Lunges
- j. Bicep curls
- k. Push ups
- l. Crunches
- m. Run in place
- n. Pull ups

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

2. One - three students per station.
3. Students will remain on each station for 30 to 60 seconds with students doing as many repetitions as possible.
4. Sound whistle to start.
5. On each consecutive whistle, students will move to the next station and continue exercising as per station.
6. Continue workout until students have completed all exercises.

RUNNING OPTION

1. The instructor will select either a 20 or 30 minute run or a 2 or 3 mile distance depending upon the fitness level of the class.
2. Run will be done on the cross country running course, sea wall, chip trail, or track. Running on sea wall or cross country running course will be done at the lowest student's fitness level.
3. Goal running times for 2 miles:
Men - 16 minutes
Women - 20 minutes
4. Goal times for 3 miles are:
Men - 24 minutes
Women - 30 minutes

Provide support vehicle, road guards or radios if running on the sea wall of chip trail.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

OBSTACLE COURSE OPTION

1. The instructor may select to take the students to the obstacle course when weather and time permit.
2. Run students to the obstacle course.
3. Give 5 minute head-call and water break.
4. Demonstrate and walk students through all obstacles.
5. Instruct students to run obstacle course at 60 to 75% maximum heart rate.
6. Line students up at starting line.
7. Start students on 10-second intervals.
8. Call out times as students cross the finish line.
9. After last student crosses finish line give 5 to 10 minute head-call and water break.
10. If time and flag condition permits run students through course again.
11. Run students back to building 3828.

Provide road guards with safety vest.

SPRINT OPTION

1. Divide the basketball court into 4 equal sections by using the free throw lines and the half court line. Each student shall run to each line

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

consecutively with a return trip to the start line before going on to the next line. After all the lines are completed including the boundary line on the other side of the court, the student running shall tag the next member of their group to start. Repeat as necessary.

2. Using cones, mark an outside area into four 25-foot sections. Run the students outdoors.

ABDOMEN WORKOUT/LOWER BODY OPTION

1. The abdominal area is divided into two separate entities when doing exercises: upper & lower. When concentrating on the upper abs, they are done almost completely alone, but when working on the lower abs the upper abs also get a workout. The obliques also depend on the upper abs for support. The recommended exercise order to work your abs is to start with lower abs, then obliques, and finally upper abs.

Only do twice a week:

Exercise order:

- a. Jumping Jacks - 20
- b. Flutter kicks - 20
- c. Good morning darling - 20
- d. Obliques - right & left side - 20
- e. 8-Count body builders - 15
- f. Dirty dog's - 20
- g. Donkey-kicks - 20
- h. Crunches - 20
- i. 4-Count lunges - 20

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- j. 1/4 Sit-Ups - 20
- k. Prone flutter kicks - 20
- l. Stomach pump-ups - 20

AIRBOXING OPTION

1. Proper punching form is essential for safety. Stand with knees slightly bent, feet should be positioned shoulder width apart.
2. Ready defensive position: defensive stance with fists loosely clenched just below the face, elbows and forearms are protecting the ribcage.
3. Avoid hyperextension of the elbows and locking of the knees.
4. Throw the following punches with a loose fist, beginning and ending with the ready position. DO NOT LOCK OUT THE ELBOWS!
 - a. Punch: Arms extend in front (imagine punching opponent's eye)

Lead students through practice of alternating right/left punches.
 - b. Jab: Arm extends double time in front (imagine jabbing opponent's eye)

Lead students through practice of alternating right/left jabs.
 - c. Cross: Arm extends crossing slightly in front (imagine punching your opponent's nose)

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

Lead students through practice of alternating right/left crosses.

- d. Hook: arm remains slightly bent and extends in front (imagine punching side of opponent's jaw)

Lead students through practice of alternating right/left hooks.

- e. Uppercut: punch comes from underneath (imagine punching opponent under the chin)

Lead students through practice of alternating right/left uppercuts.

- f. Flurry: punch comes from underneath, alternating right and left uppercuts, double time (imagine a series of alternating uppercuts)

Keep head up during flurry punches.

Lead students through practice of flurry punches.

- g. Speed bag: both hands in air level with face, imitate punching a speed bag.

Lead students through practice of speed bag.

- h. Combination: any combination of more than two different punches thrown in succession.

Lead students through practice of a combination punch.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- i. Demonstrate boxer shuffle step: primary step to be used throughout choreography of different punches. Shift weight back and forth right to left foot, weight on front portion of foot.

Do not lock out knees.

After demonstration, have students practice boxer shuffle step in ready position.

6. Session One:

- (1) Shuffle, arms ready position
- (2) Alternate right/left punch
- (3) Shuffle
- (4) Alternate right jab/left jab
- (5) Shuffle
- (6) Right punch, right punch, left jab
(right combination jab)
- (7) Shuffle
- (8) Left punch, left punch, right jab
(right combination jab)
- (9) Shuffle, arms ready position
- (10) Repeat steps 4 through 9, substituting cross for jab

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (11) Repeat steps 4 through 9, substituting hook for jab
- (12) Repeat steps 4 through 9, substituting uppercut for jab
- (13) Shuffle, arms ready position
- (14) side to side step, flurry
- (15) Simulate skipping rope
- (16) Simulate jumping rope
- (17) Cross country skier exercise
- (18) Speed bag
- (19) Jumping jack foot movement, arms simulate skipping rope
- (20) ½ jumping jack foot movement, arms simulate skipping rope
- (21) Repeat steps 14 through 20
- (22) Walk in place
- (23) Side to side step, arms extended out to sides palms up

Keep feet moving, head up at all times.

Knees don't extend past toes.
Don't bend leg beyond 90° angle. Keep back straight, head up.

Arms slightly bent at elbows, no bouncing leg movements. Muscular endurance, don't

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (24) Side to side step, bend elbows make hands into fist, bring fist to shoulder. Pump biceps.
- (25) side to side step, palms down, make small clockwise circles with hands, reverse motion of hands
- (26) Side step, shoulder press
- (27) Side step, press out to side
- (28) Speed bag, shuffle feet
- (29) Walk in place
- (30) Side to side step, flurry
- (31) Simulate skipping rope
- (32) Simulate jumping rope
- (33) Cross country skier exercise
- (34) Jumping jack foot movement, lateral arm raise movement
- (35) ½ jumping jack foot movement, lateral arm raise movement
- (36) Perform boxer shuffle, any combination punch for a period of 60 seconds

allow arms to drop.

Keeps arms slightly bent. No bouncing leg movements while performing arm circles.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- | | |
|--|----------------------------|
| (37) Perform boxer shuffle, any combination punch for a period of 60 seconds | |
| (38) Side to side step, flurry | |
| (39) Simulate skipping rope | |
| (40) Simulate jumping rope | |
| (41) Cross country skier exercise | |
| (42) Jumping jack foot movement, lateral arm raise movement | |
| (43) ½ jumping jack foot movement, lateral arm raise movement | |
| (44) Perform boxer shuffle, any punch for a period of 30 seconds | |
| (45) Perform boxer shuffle, any punch for a period of 30 seconds | |
| (46) Walk in place | |
| (47) Side to side step, flurry | Head up, keep feet moving. |
| (48) Walk in place, slowing down pace gradually | One to two minutes. |
7. NOTE: The airboxing workout may be personalized by utilizing any of the following approved exercises in conjunction with the choreography listed above.
- (1) Jumping jacks

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (2) ½ jumping jacks
- (3) Simulate jumping rope
- (4) Simulate skipping rope
- (5) Walk in place
- (6) Run in place
- (7) Side steps
- (8) Forward steps
- (9) Lunges
- (10) Squats
- (11) Cross country skier

NOTE: For LUNGES, SQUATS, CROSS COUNTRY SKIERS, do not extend knees past toes. Leg doesn't go beyond 90° angle, keep back straight and head up.

- (12) Biceps curls
- (13) Sun Gods / Arm circles (small - forward/backward)
- (14) Shoulder press (up)
- (15) Shoulder press (out to side)

Keeps arms slightly bent. No bouncing leg movements while performing arm circles.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

(16) Lateral arm raise, elbows bent

8. Session Two

(1) Perform pelvic tilt exercise. Laying on back arms supporting lower back, gently lift pelvis toward ceiling and lower, using abdomen muscles.
15 repetitions.

Ensure the students keep the lower back on the deck by placing their hands underneath their buttocks while performing leg lifting exercises. This will add support to the lower back, and will prevent injury.

(2) Perform bicycle crunches.
15 repetitions.

(3) Perform oblique crunches right side.
15-25 repetitions.

(4) Perform oblique crunches left side.
15-25 repetitions.

(5) Perform abdominal crunch exercise.
15-25 repetitions.

(6) Relax for 30 seconds.

(7) Perform two or three sets of session two at instructor's discretion and based on fitness level of class.

STATIONARY SHALLOW WATER WORKOUT

1. Perform Sun Gods for 1 minute.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- a. Stand in chest or shoulder deep water, feet shoulder width apart. Arms slightly below water surface.
 - b. Extend arms out to the side, palms facing down; push downward against the water.
 - c. Rotate wrist with palms facing upward and lift pushing against the water.
 - d. Extend arms in front and together, palms facing each other.
 - e. Push arms outward against the water and then back towards the centerline.
2. Jog in place for 1 minute.
 - a. Stand in chest deep water.
 - b. Jog in place.
 3. Kick butts for 1 minute.
 - a. Stand in chest deep water.
 - b. Jog in place and bring heels to buttock.
 4. Jog in place for 1 minute.
 - a. Stand in chest deep water.
 - b. Jog in place.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

5. High knees for 1 minute.
 - a. Stand in chest deep water.
 - b. Jog in place and bring knees up to chest.
6. Jog in place for 1 minute.
 - a. Stand in chest deep water.
 - b. Jog in place.
7. One leg hop for 1 minute - 4 times each leg.
 - a. Stand in chest deep water.
 - b. Feet shoulder width apart.
 - c. Lift one leg up and hop on the other leg.
 - d. Bend the leg slightly at impact.
 - e. Switch to other leg.
8. Run fast in place for 1 minute.
 - a. Stand in chest deep water.
 - b. Run in place fast.
9. Jog in place for 1 minute.
 - a. Stand in chest deep water.
 - b. Jog in place.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

10. Cross-country skiers for 1 minute.
 - a. Stand in chest deep water.
 - b. Extend same arm and leg forward and opposite leg and arm back.
 - c. In one movement extend the same side arm and leg back and move the opposite leg and arm forward.
 - d. Repeat.
11. Gutter push-ups for 1 minute.
 - a. Stand next to the gutter facing the wall.
 - b. Cross ankles and place palms on the edge of the gutter.
 - c. Press hands downward lifting the body and extending the arms.
 - d. Lower the body by bending at the elbows.
 - e. Repeat.
12. Flutter kicks for 1 minute.
 - a. Stand next to the gutter facing the wall.
 - b. Place elbows and forearms in the gutter. Hands facing each other.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- c. Extend feet out and back.
 - d. Flutter kick approximately 6 to 12 inches.
13. Gutter dips for 1 minute.
- a. Stand next to the gutter facing away from the wall.
 - b. Place palms on edge of gutter facing away from the wall.
 - c. Extend arms pushing downward lifting the body.
 - d. Bend at the elbows, approximately 90° angle, lowering the body.
 - e. Repeat.
14. Bicycles for 1 minute.
- a. Stand next to the wall facing away.
 - b. Extend arms over and parallel to the gutter.
 - c. Place arms in the gutter and support the body while extending the legs out.
 - d. Bring one leg back towards the chest by bending at the knee to a 90° angle. Place the other leg straight out.
 - e. Rotate by bicycling in place.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

SHALLOW WATER WORKOUT

1. Breast stroke - (down and back)
2. Push-ups - (10)
3. Dips - (10)
4. Running - (down and back)
5. Push-ups - (10)
6. Dips - (10)
7. Side stroke - (left - down and right - back)
8. Backward running - (down and back)
9. Push-ups - (10)
10. Dips - (10)
11. Crawl stroke - (down and back)
12. Push-ups - (10)
13. Dips - (10)
14. Sideways running - (down and back)
15. Push-ups - (10)
16. Dips = (10)
17. Back stroke - (down and back)

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

18. Push-ups - (10)
19. Dips - (10)
20. Crawl stroke - (down and back)

N. Cool Down Stretching

1. Side to side stretch - same as warm-up
2. Tricep stretch - same as warm-up
3. Chest stretch - same as warm-up
4. Posterior shoulder stretch - same as warm-up
5. Trunk twist (seated) - same as warm-up
6. Inside hurler - same as warm-up
7. Groin stretch - same as warm-up
8. BUD/S knee stretch - same as warm-up
9. Ankle rotation- same as warm-up
10. Quadricep stretch - same as warm-up
11. Lower back stretch - same as warm-up
12. Abdominal stretch - same as warm-up
13. Calf stretch - same as warm-up

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

14. Achilles tendon stretch - same as warm-up

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

SUMMARY/REVIEW

- A. State Lesson Objectives
- B. Review Major Teaching Points

Turn to cover page for objectives.

Briefly summarize.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

APPLICATION

A. See Presentation for Application.

EVALUATION: None

ASSIGNMENT: None

LESSON PLAN

JANUARY 2005

COURSE TITLE: Physical Training
Instructor Training Course
P-9E-1238

CLASSIFICATION: Unclassified

LESSON TOPIC NUMBER: 1.17

LESSON TOPIC: Physical Training

ALLOTTED LESSON TIME: 2.0 Laboratory

INSTRUCTIONAL SUPPORT:

- 1 Laboratory Instructor
- 1 Assistant Instructor
- 1 Lifeguard

INSTRUCTIONAL REFERENCES:

- 1. New Fitness Coordinator Exercise Leader Handbook
- 2. Naval Special Warfare Calisthenics
- 3. Navy Swimming and Water survival Instructor's Manual CNET P-1552/16
- 4. Red Cross Swimming and Diving
- 5. RSS Lesson 2.1
- 6. Remedial Lesson 1.10

TERMINAL OBJECTIVE:

Partially supported by this lesson topic:

- 1.0 Upon completion of this unit of instruction the Physical Training Instructor Under Training will demonstrate knowledge to instruct, demonstrate, and facilitate students in the NAVAVSCOLSCOM Physical Training Instructor (PTI) Course curriculum without injury to personnel or damage to equipment.

ENABLING OBJECTIVES:

Partially supported by this lesson topic:

- 1.54 Comply with safety procedures while exercising.
- 1.55 Perform warm up exercises/ stretching.
- 1.56 Perform Physical Training conditioning program.
- 1.57 Perform cool-down stretching

CRITERION TEST:

None

HOMEWORK:

None

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

INSTRUCTIONAL AIDS:

1. Stop watch
2. Whistle
3. Station plaques
4. Amplifier speakers
5. Remote microphone headset
6. Stereo Cassette/CD player
7. Airboxing CD/Tape
8. Circuit Training Equipment
9. Water Aerobics Equipment

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

INTRODUCTION

A. Establish Contact

Display name and lesson topic.

1. Introduce self, give rank, current job.
2. State background, schools, duty stations, etc.
3. State question and answer policy.
4. Describe nonverbal TTO signal.

Nonverbal training time out may be signaled by placing a hand horizontally over a hand held vertically forming the letter "T".

5. Ask for medical concerns:

- a. Has anyone gone to the hospital/branch clinic for treatment within 24 hours, and are you taking any medication?
- b. Has anyone taken over-the-counter medications within 24 hours?
- c. Are there any potentially disqualifying illnesses/conditions for which you are currently being treated?

B. State Lesson Objectives

Turn to cover page of lesson plan and paraphrase objectives.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

C. Establish Readiness

1. Motivating statements

Establish importance and relevance of lesson material using personal experience or anecdote.

2. Lesson overview

Briefly outline material to be covered.

a. Lesson Topic: Physical Training (aerobic)

b. Major Teaching Points:

- (1) Safety in Exercising
- (2) Warm-up Exercising/Stretching
- (3) Exercise Techniques
- (4) Interval Training
- (5) Calisthenics
- (6) Station Training
- (7) Running
- (8) Obstacle Course
- (9) Sprints
- (10) Abdomen / Lower Body Workout

DISCUSSION POINT

- (11) Airboxing Conditioning Workout
- (12) Stationary Shallow Water Workout
- (13) Shallow Water Workout
- (14) Cool-down Stretching

RELATED INSTRUCTOR ACTIVITY

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

PRESENTATION

A. Safety in Exercising

1. Hydrate before and after exercising.
2. Maintain proper form.
3. Don't hold your breath during exercise.
4. Don't work out if you're ill.
5. When performing high impact exercises, ensure you land with knees slightly bent "soft".
6. Balance out hip flexor exercises with hip extensor exercises to keep muscle balance.
7. When performing exercises where the knee extends out in front of your body, ensure the knees do not extend past the toes.

Instructor will ensure students take head/call water break after warm-up, between options (if more than one) and before cool down. Briefly reiterate main safety points from previous chapters.

B. Explain/Demonstrate Warm-up Exercising/Stretching

1. Slow jogging or running in place - 1.5 minutes of easy jogging (three laps around basketball court)
Purpose: warm-up and conditioning
2. Four-Count jumping jacks - 15 repetitions.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

Purpose: Warm-up and conditioning

- a. From a standing position:
- b. Ready, stand with arms at side (begin).
- c. One, raise arms overhead relatively straight. Feet slightly wider than shoulder width and knees slightly bent. Knees should flex in both positions.
- d. Two, return to the ready position.
- e. Three, same as one.
- f. Four, is not sounded, (count repetitions).

3. Four count bicycle crunches - 10 repetitions.

Purpose: Warm-up and abdominal strength/conditioning

- a. From a lying position on back:
- b. Fingers placed at side of head, supporting head. Legs shall be straight and feet six inches off the ground. Bring one knee towards the chest and the opposite elbow up to touch it this is "one"
- c. Return to the starting position and repeat with the opposite leg and elbow, this is count of two.

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- d. As you alternate elbow to knee, count "three" and "four."

4. Bent-knee push-ups - 15 repetitions

Purpose: Warm-up and chest/arm strength/conditioning

- a. From a lying position on the stomach:
- b. "Ready" on hands and knees with the arms straight.
- c. "Down", Lower body toward ground until upper arm is parallel with ground.
- d. Return to starting position, count repetitions.

5. Side to Side stretch

Purpose: Stretch the latissimus dorsi

- a. From a standing position:
- b. Stand with feet shoulders width apart. Extend the left arm straight up and grasp the left wrist with the right hand. Slowly lean to the right without bending forward at the waist.
- c. Repeat in the opposite direction.

6. Tricep stretch

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

Purpose: Stretch the back of the arm muscle
(Tricep Brachii)

- a. From a standing position:
- b. Touch the left shoulder blade with the left hand and press gently backwards on the left elbow with the right hand.
- c. Repeat for the right arm.

7. Chest stretch

Purpose: Stretch for the chest.

- a. From a standing position:
- b. Extend arms to the side at shoulder level.
- c. Keeping thumbs pointed up, extend arms backward.
- d. Either have another person hold the stretch or use a pole for resistance.

8. Posterior shoulder stretch

Purpose: Stretch for the posterior shoulder.

- a. From a standing position:
- b. Reach the right arm straight out and across the chest.
- c. With the left hand, grasp the right arm just

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

above the elbow.

- d. Gently pull right arm across the body.
- e. Repeat for other shoulder.

9. Trunk twist (seated)

Purpose: Stretch for the trunk.

- a. From a seated position:
- b. Clasp both hands in front of the chest, twist the upper torso to one side and hold for 10 seconds.
- c. Repeat to opposite side.

10. Inside hurdler

Purpose: Stretch for the hamstrings.

- a. From a seated position:
- b. Extend left leg with toes pointing straight up. Bend the right leg until the sole of the right foot is touching the inside of the left knee. Bend forward at the waist, taking chest toward left knee.
- d. Repeat for the right leg.

11. Groin stretch

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Purpose: Stretch for the groin area.

- a. From a seated position:
- b. While sitting with the soles of the feet together and back straight, grasp both ankles and pull them as close to the body as possible. Gently relax the musculature of the inner thigh, allowing the weight of the knees to stretch the muscles. If more pressure is needed, use your elbows to supply a gently pressure, downward on the knees.

12. BUD/S knee (ITB)

Purpose: Stretch for the iliotibial band.

- a. From a seated position:
- b. Stretch left leg straight out or flat on the deck.
- c. Hook right foot over left leg, near the knee.
- d. Gently twist trunk to the right.
- e. Repeat to left.

13. Ankle rotation

Purpose: Dynamic stretch for the ankles.

- a. From the seated position:
- b. Bend and bring the right ankle over the left

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

thigh.

- c. Hold right ankle with right hand, lifting it above the left thigh.
- d. With the left hand, rotate the right ankle clockwise and counter clockwise.
- e. Repeat for other ankle.

14. Quadriceps stretch

Purpose: Stretch for the quadriceps.

- a. From a standing position or lying on the stomach:
- b. Bend the left leg and grasp the left ankle with the left hand. Pull the foot toward buttocks, keeping the knees together.
- c. Repeat, for the right leg.

15. Lower back stretch (one or two legs)

Purpose: Stretch for the lower back.

- a. From a lying position on the back:
- b. Lying on back, curl both knees up to chest while placing hands in the bend behind the respective knee. Hold knees to chest with hands, relaxing back muscles.

SAFETY NOTE

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

If pain is felt, STOP stretching at once, and let the Primary Instructor know.

16. Abdominal stretch

Purpose: Stretch the stomach (Rectus Abdominis).

- a. From a lying position on the stomach:
- b. Push up onto elbows while leaving the hips on the deck. Pull up tall from the waist.

17. Calf stretch

Purpose: Stretch the calves (Gastrocnemius) and Achilles tendons.

- a. From a standing position, next to a wall or stationary object:
- b. Stand facing the wall approximately four feet away. Lean against the wall, bring the right leg forward while keeping the left leg extended and left heel flat on the deck.
- c. After calf stretch, bend the left knee and shift weight forward to stretch Achilles tendon.
- d. Repeat, a. and b. for the right leg.
- e. Now stretch with both legs extended, heels flat on the deck.

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18. Achilles tendon stretch

Purpose: Achilles tendon stretch.

- a. From the standing position with hands on hips:
- b. Stand with feet shoulder width apart and step forward approximately 6 inches with one foot.
- c. Sit back over back heel and slightly bend knees, keeping back heel on the ground.

C. Cardiovascular/Muscular Endurance Exercises. The following exercises are utilized in the cardiovascular exercise options. Ensuring proper form is an important factor in injury prevention. The instructor should explain and demonstrate exercises used in the physical training session prior to leading students in any exercises. Select number of exercises/options depending upon the fitness level of the class.

1. Side Straddle Hop / $\frac{1}{4}$ side straddle hop

Description: This is a four-count exercise. Begin from a standing position with feet together and hands at sides. On the first count, jump up while bringing hands together over the head and landing with feet apart. On the second count, jump back to toe starting position. The third count repeats the action performed during the first count, and on the fourth count return to the starting position.

DISCUSSION POINT

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a. $\frac{1}{4}$ side straddle hop - with arms bent at elbows, bring arms up level to shoulders only.

Purpose: Cardiovascular exercise.

2. Sun Gods (Air Circles)

Description: Extend the arms out and to the sides, elbows slightly bent. Move arms in small circles.

Purpose: Endurance exercise for the shoulder muscles.

3. Push-Ups (Wide, Standard, and Narrow)

Description: This is a two-count exercise. Begin lying on the stomach with hands and feet on the deck, arms extended, and the head facing forward. On the first count, bend the elbows to at least a 90° angle, lowering the chest toward the deck. On the second count, extend the arms back to the starting position.

Purpose: Conditioning exercises which primarily incorporate chest and anterior shoulder muscles, secondarily incorporate the triceps and abdominal muscles.

Note: These exercises should be performed first with the hands placed wider apart than shoulder width (wide push-ups), then gradually move the hands closer together so the smaller muscles (i.e., triceps) are worked last. Starting wide

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circumvents the problems of fatiguing the triceps prior to fatiguing the pectorals.

4. Obliques sit-ups (right and left)

Description: Begin by lying on the back with the hands clasped behind the head. Legs can be either bent at the knees with feet on the deck or bent with the knees toward the chest (feet elevated from the deck), or with one leg crossed over the knee of the opposite leg. Slowly lift and twist the torso, bring one shoulder toward the knee of the opposite leg. Return to starting position. Perform exercise on both sides.

Purpose: Conditioning exercise for the abdominal and oblique.

5. Eight Count Body Builders

Description: This is an eight-count exercise that starts from a standing position.

On the first count, bend the legs and place the hands on the deck.

On the second count, extend both the legs back supporting the body weight with the extended arms (push-up position).

On the third count, bend the elbows, lowering the chest toward the deck.

On the fourth count, extend the arms.

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On the fifth count, separate the legs while keeping the arms extended.

On the sixth count, bring the legs back together as they were on the fourth count.

On the seventh count, flex the legs and bring them back to the first-count position.

On the eighth count, return to the starting position.

Purpose: Conditioning exercise which primarily incorporates chest, anterior shoulder, and leg muscles, secondarily incorporates triceps, abdominals. Cardiovascular conditioning exercise.

6. Prone back extension

Description: Lying face down on the deck, hands clasped behind the back, lift the upper torso off the deck, hold, and return to starting position.

Purpose: Conditioning exercise for the back and hip extensors.

Note:

- (a) Avoid hypertension of the back.
- (b) Placement of the hands alters the difficulty.
 - 1) Behind the back - easiest

DISCUSSION POINT

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- 2) Behind the head - more difficult
- 3) Straight out in front is the most difficult.

7. Hip Rollers

Description: Lying on your back with legs bent and elevated off the deck, slowly bring both knees down together on one side until the lower back begins to lift off the deck. Bring the knees back to the starting position, then repeat on the other side.

Purpose: Conditioning exercise for abdomen.

8. One / Two Legged squat

Description: Using one or both legs to support the body weight, bend until the thigh is almost parallel to ground and return to starting position. If one legged - repeat using the other leg.

Purpose: Conditioning exercise for the hip and thigh muscles.

NOTE:

This exercise is good when equipment and/or weights are unavailable. Squat exercise should be performed with the upper portion of the legs parallel to the ground. Squatting lower places excessive stress on the knee. Knees should never extend beyond toes when in squat position.

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9. The Superman (prone or kneeling)

Description: This exercise can be performed either lying on the stomach or on the hands and knees. The opposite arm and leg (i.e., right arm, left leg) should be lifted and held for 3 to 5 seconds, then slowly lowered. The same movements should then be made with the other arm and opposite leg.

Purpose: Conditioning exercise for the back muscles and hip extensors.

NOTE:

This exercise helps develop balanced strength between the hip flexors and extensors. It is very safe, and although it may look easy, it can burn after a period of time. Adding weight to the arms and legs makes the Superman more difficult. Avoid hypertension of the back, the leg should not be raised higher than the hip when in the kneeling position.

10. Dive Bomber Push-Ups

Description: This is a two-count exercise. Start by on the stomach with the feet spread approximately 3 feet apart, hands on the deck, elbows fully extended, and hips slightly lifted. On the first count, the upper torso sweeps down toward the deck between and through the hand while bending the elbows. The resting position is the down position of a basic push-up. On the second

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count, the upper torso sweeps back and up while the elbows extend to return starting position.

Purpose: Conditioning exercise for the forearms, chest, anterior deltoids, and triceps.

11. Stomach Pump-Ups

Description: Begin by lying on the back with knees bent, feet on the deck, and hands on hips. Then lift and lower the upper torso.

Purpose: Conditioning exercise for the abdominal and hip flexors.

NOTE:

Limit the use of this exercise. Keeping the mid to low back on the ground prevents engagement of the hip flexors.

12. Good Morning Darling

Description: This is a four-count exercise. Start by lying on the back, with hands under the hips, legs extended, and feet together, 6 inches above the deck. On the first count, spread the legs 2 to 3 feet apart. On the second count, bring the legs back together. The third count repeats the first position. On the fourth count, the legs come back together.

Purpose: Conditioning exercise for the abdominal and hip flexors.

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NOTE:

Limit the use of this exercise. This exercise has potential for injury to the discs and lower back, always maintain proper technique.

13. Dirty Dogs

Description: On hand and knees, keeping the legs bent, lift one leg, knee pointing outward, to the end of range of motion. Switch to the other leg.

Purpose: Conditioning exercise for the hip/thigh abductors.

14. Leg Levers

Description: Lying on the back with arms under and supporting the lower back, slowly left leg approximately 2 feet off the deck right leg is kept on deck, and lowered down again. Repeat with right leg approximately 2 feet off the deck and left leg on deck.

Purpose: Conditioning for the abdominals and hip flexors.

15. Donkey Kicks

Descriptions: On hands and knees, extend one leg out behind, then bring it back. For the count or time limit, then the opposite leg.

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Purpose: Conditioning exercise for the hip extensors.

NOTE:

This exercise may be combined with Dirty Dogs. The same leg would be lifted to the side and returned, then extended behind and returned. **To avoid hypertension of the back the leg should not be raised higher than the hip.**

16. Flutter Kicks

Description: This is a four-count exercise. Start by lying on the back, with hands under the hips supporting the lower back, legs extended, and feet together, 6 inches above the deck. On the first count lift the right about 1-1/2 feet, keeping the left leg straight. On the second count, lift the left leg to same position while returning the right leg to starting position. Third count, bring the right leg back up, while returning the left leg to starting position. Fourth-count, shift legs once more.

Purpose: Conditioning exercise for the abdominal and hip flexors.

NOTE:

Limit the use of this exercise and maintain proper technique.

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17. Prone Flutter Kicks

Description: This exercise is the Flutter Kick performed lying on stomach.

Purpose: Conditioning exercise for the back and hip extensors.

NOTE:

Avoid Hyperextension of the back. Exercises that work the hip extensors are highly recommended because they help balance out the hip flexor conditioning.

18. Crunches

Description: Lying on the back with legs bent and elevated off the deck, either place the hands behind the neck or cross the arms on the chest. Lift the upper torso 10 to 12 inches off the ground and then return to the starting position.

Purpose: Conditioning exercise for the abdominal.

NOTE:

There are many variations to this exercise. For example, the legs may be bent with feet on the deck, bent with knees towards the chest and feet elevated, or extended vertically. The arms also may be placed in several positions including alongside the body (easiest), across the chest (easy) hands behind the head (difficult), or hands clasped above the head (most difficult).

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19. Side to Side hop (downhill ski)

Description: Standing with feet together and slightly bent. Jump from side to side keeping the feet together and bending at the knees absorbing the shock.

Purpose: Conditioning exercise for the legs and cardiovascular system.

20. Cross-country Skier

Description: Standing with feet together and hands to the side. Extend right hand and simultaneously move left foot back approximately 12 inches. Repeat with other hand and foot. Continue mimicking a cross-country skier.

Purpose: Conditioning exercise for the hip extensors, legs and cardiovascular system.

21. Rope Climb

Description: Ascend the rope using both hands and feet. A hand-over-hand method of climb should be used. The feet are employed by wrapping a leg around the rope along with pushing the feet together with the rope in between. After descending the rope, the student shall repeat the exercise.

Purpose: Conditioning exercise for upper body strength.

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22. Rope Skip and Rope Hop

Description: Grab the handles of the rope. Throw the rope over head and skip rope alternating legs or hop rope landing on both feet at one time.

Remember to land with knees slightly bent "soft".

Purpose: Conditioning exercise for the cardiovascular system.

23. Versa Climber

Description: Place feet in feet holder, grab handles with hands. Move feet up and down at a fast pace with arms movement following.

Purpose: Conditioning exercise for the cardiovascular system.

24. Bicycle Crunches

Description: Lie on back with fingers placed at side of head, supporting head. Legs shall be straight and feet six inches off the ground. Bring one knee towards the chest and the opposite elbow up to touch it then return to the starting position and repeat with the opposite leg and elbow. Repeat this until time is expired.

Purpose: Primary conditioning exercise for the abdomen and secondary exercises the hip flexors.

25. Hand Walks

Description: This exercise is performed on the parallel bars. The student will start at full arm

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extension on the bars and keeping the arms fully extended, travel from one end of the bar to the other. Jump down and repeat.

Purpose: Conditioning exercise for the chest, shoulders, forearms and triceps.

26. Dips

Description: Dips will be performed utilizing a bench and the platform at the north end of the gym. Start by sitting on the edge of the platform with the legs extended and resting on the bench. With the hands on the platform, lower the body as far as possible, then extend arms back to full extension.

Purpose: Conditioning exercise for the chest, anterior and medial shoulders, triceps.

27. Pull-ups

Description: Pull-ups will be performed on the pull-up bars at the south end of the gym. Palms forward, full arm hang; pull-up until chin passes over the bar, then return to full arm hang position. Repeat. (NO kicking of feet allowed).

Purpose: Conditioning exercise for the back, posterior deltoids, and biceps.

Note: If personnel needs assistance, spotter should always provide support at the waist area, DO NOT hold feet.

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28. Situps and $\frac{1}{4}$ situps

Start by lying flat on their back with knees bent, heels about 10 inches from buttocks. Arms shall be folded across and touching the chest, with hands touching upper chest or shoulders. Feet shall be held to floor only by partner's hands. Curl body up, touching elbows to thighs while keeping hands in contact with the chest or shoulders. After touching elbows to thighs, the student lies back, touching lower edge of shoulder blades to deck. On $\frac{1}{4}$ situps, body is only raised to $\frac{1}{4}$ degree rather than upright and hands may be placed on the thighs or across the chest with or without feet being held by a partner.

Purpose: Conditioning exercise primarily for the abdominals, hip flexors, and secondarily the quadriceps.

29. Bicep curls

With weight or without, make hands into fist. Palms down by sides facing in toward the body, slowly bend elbow, raising and rotating the fist until it is facing the anterior shoulder. Attempt to lift the weight slowly, do not use the momentum of the movement to lift the weight. The elbow should remain close to the side.

Purpose: Conditioning exercise for the biceps.

D. The instructor may select more than one option depending upon the fitness level of the class. Select from the following workout options:

Check flag conditions if conducting exercises outside.

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INTERVAL TRAINING OPTION

1. Interval training is based upon proven scientific methods. These methods allow a person to improve their aerobic or anaerobic fitness performance. Intervals contain an exercise followed by a rest period. Intervals may be modified in frequency, intensity, and time. Adjustments can be made to specifically meet the athlete's requirements and goals. Longer intervals (880+) improve endurance and time and engage the Slow Oxidative (SO) fibers (primary) and the fast twitch Fast Oxidative Glycolytic (FOG) fibers (secondary). Medium intervals (440) improve speed and engage both types of fast twitch fibers: the FOG (primary) and and Fast Glycogenolytic (FG) (secondary) fibers. Shorter intervals (220-) improve speed and engage the fast twitch FG (primary) and FOB (secondary) fibers. To prescribe interval training, ensure the athlete has a good cardiovascular base (endurance/time) before they begin training for speed. The instructor must also determine the athlete's "standard". To determine their standard, they must run their best time at whichever distance they are training for.
2. Intervals permit high intensity exercises for a relatively long period of time, i.e., not many people can maintain a 4 minute mile pace for an entire mile. Most people can maintain four 15 second bursts at a 4-minute mile pace with rest periods in between the 15-second run.
3. To determine run/rest ratios the following formulas may be used:

Higher intensity = higher rest!

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- | | | |
|----|--|---|
| a. | For shorter, high intensity anaerobic exercise using FG/FOG fibers the run/rest ratio is 1:3. A one-minute interval would be followed by three minutes of rest. | 220 or shorter |
| b. | For high/medium intensity anaerobic exercise using FOG/FG fibers, the run/rest ratio is 1:2. A two-minute interval would be followed by four minutes of rest. | 440 |
| c. | For lower intensity aerobic exercise using both SO and FOG fibers, the run/rest ratio is 1:1.5. A six-minute interval would be followed by nine minutes of rest. | 880 or longer |
| 4. | Interval training should not account for more than 10% of your total mileage per week. If you run 10 miles a week, interval training should not account for more than one mile. | You must be realistic about the student's fitness level and goals. Adjust workouts accordingly. |
| 5. | Examples: | |
| a. | Example: A student wishes to improve his speed on the 220, ½ a lap. The student runs his fastest 220 at 50 seconds. Therefore his standard is 50 seconds. He can not run faster than his fastest time. He will run 220 intervals at a rate slightly slower (3-5 seconds) than his fastest time: 53-55 seconds per 220 with 2:45 seconds of rest between intervals. | FG/FOG Fibers Anaerobic Rest Ratio 1:3 |
| b. | Example: An 8-minute mile can be broken down | FOG/FG Fibers Anaerobic |

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into intervals of four 440s. This is one lap around a normal high school track. When divided, these 440s should take 2 minutes each. When running these 440s each 440 should be run 1-4 seconds faster than the divided two minutes, one 440/lap should be run at 1:56 with a rest of 3:52. After 4-6 weeks, the student's best mile should drop by a few seconds.

Rest ratio 1:2

- c. Example: An 8-minute mile can be broken down into two 880 yard intervals. You would add 8 seconds to the 880 yard interval, giving you a time of 4:08 per 880. Your rest period would be 6:12.

SO/FOG Fibers Aerobic
Rest ratio 1:1.5

6. Instructor determine which interval - 880/440 the class will run.
- (1) Determine students' best mile. Instruct students to run best mile.
 - (2) Call out students' $\frac{1}{4}$ (440) mile times and insure students remember finish time.
 - (3) Determine students' interval and rest time period using formulas from above.

Muster on running track

CALISTHENICS OPTION

1. Each exercise will be for a minimum of 30 seconds with a ten-second transition period between exercises.

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2. At the discretion of the instructor and depending on the fitness level of the class, the order of and the number of calisthenics may be change
 - a. Running in place (slow)
 - b. Side straddle hop
 - c. Squats (2 Leg)
 - d. Superman
 - e. Skip rope
 - f. Sun gods
 - g. Push-ups
 - h. Oblique sit-ups (R)
 - i. Oblique sit-ups (L)
 - j. One leg squat (R)
 - k. One leg squat (L)
 - l. Dive bomber push-up
 - m. Lunges
 - n. Hip rollers
 - o. Crunches
 - p. Run (slow to fast)
 - q. Side to side hop
 - r. Run (push arms up)
 - s. Bicycle crunches
 - t. Dirty Dogs
 - u. Jumps (soft knees)
 - v. Cross country skier
 - w. Run (slow down)

STATION TRAINING

1. Instructor shall place station plaques in a circular pattern. Instructor can change the order of the stations and alternate stations can be used

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with a large class.

- a. Rope climb
- b. Rope skip
- c. 8 count body builders
- d. Versaclimber
- e. Obliques (R)
- f. Obliques (L)
- g. Bicycle crunches
- h. Jumping jacks
- i. Lunges
- j. Bicep curls
- k. Push ups
- l. Crunches
- m. Run in place
- n. Pull ups

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2. One - three students per station.
3. Students will remain on each station for 30 to 60 seconds with students doing as many repetitions as possible.
4. Sound whistle to start.
5. On each consecutive whistle, students will move to the next station and continue exercising as per station.
6. Continue workout until students have completed all exercises.

RUNNING OPTION

1. The instructor will select either a 20 or 30 minute run or a 2 or 3 mile distance depending upon the fitness level of the class.
2. Run will be done on the cross country running course, sea wall, chip trail, or track. Running on sea wall or cross country running course will be done at the lowest student's fitness level.
3. Goal running times for 2 miles:
Men - 16 minutes
Women - 20 minutes
4. Goal times for 3 miles are:
Men - 24 minutes
Women - 30 minutes

Provide support vehicle, road guards or radios if running on the sea wall of chip trail.

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OBSTACLE COURSE OPTION

1. The instructor may select to take the students to the obstacle course when weather and time permit.
2. Run students to the obstacle course.
3. Give 5 minute head-call and water break.
4. Demonstrate and walk students through all obstacles.
5. Instruct students to run obstacle course at 60 to 75% maximum heart rate.
6. Line students up at starting line.
7. Start students on 10-second intervals.
8. Call out times as students cross the finish line.
9. After last student crosses finish line give 5 to 10 minute head-call and water break.
10. If time and flag condition permits run students through course again.
11. Run students back to building 3828.

Provide road guards with safety vest.

SPRINT OPTION

1. Divide the basketball court into 4 equal sections by using the free throw lines and the half court line. Each student shall run to each line

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consecutively with a return trip to the start line before going on to the next line. After all the lines are completed including the boundary line on the other side of the court, the student running shall tag the next member of their group to start. Repeat as necessary.

2. Using cones, mark an outside area into four 25-foot sections. Run the students outdoors.

ABDOMEN WORKOUT/LOWER BODY OPTION

1. The abdominal area is divided into two separate entities when doing exercises: upper & lower. When concentrating on the upper abs, they are done almost completely alone, but when working on the lower abs the upper abs also get a workout. The obliques also depend on the upper abs for support. The recommended exercise order to work your abs is to start with lower abs, then obliques, and finally upper abs.

Only do twice a week:

Exercise order:

- a. Jumping Jacks - 20
- b. Flutter kicks - 20
- c. Good morning darling - 20
- d. Obliques - right & left side - 20
- e. 8-Count body builders - 15
- f. Dirty dog's - 20
- g. Donkey-kicks - 20
- h. Crunches - 20
- i. 4-Count lunges - 20

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- j. 1/4 Sit-Ups - 20
- k. Prone flutter kicks - 20
- l. Stomach pump-ups - 20

AIRBOXING OPTION

1. Proper punching form is essential for safety. Stand with knees slightly bent, feet should be positioned shoulder width apart.
2. Ready defensive position: defensive stance with fists loosely clenched just below the face, elbows and forearms are protecting the ribcage.
3. Avoid hyperextension of the elbows and locking of the knees.
4. Throw the following punches with a loose fist, beginning and ending with the ready position. DO NOT LOCK OUT THE ELBOWS!
 - a. Punch: Arms extend in front (imagine punching opponent's eye)

Lead students through practice of alternating right/left punches.
 - b. Jab: Arm extends double time in front (imagine jabbing opponent's eye)

Lead students through practice of alternating right/left jabs.
 - c. Cross: Arm extends crossing slightly in front (imagine punching your opponent's nose)

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Lead students through practice of alternating right/left crosses.

- d. Hook: arm remains slightly bent and extends in front (imagine punching side of opponent's jaw)

Lead students through practice of alternating right/left hooks.

- e. Uppercut: punch comes from underneath (imagine punching opponent under the chin)

Lead students through practice of alternating right/left uppercuts.

- f. Flurry: punch comes from underneath, alternating right and left uppercuts, double time (imagine a series of alternating uppercuts)

Keep head up during flurry punches.

Lead students through practice of flurry punches.

- g. Speed bag: both hands in air level with face, imitate punching a speed bag.

Lead students through practice of speed bag.

- h. Combination: any combination of more than two different punches thrown in succession.

Lead students through practice of a combination punch.

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- i. Demonstrate boxer shuffle step: primary step to be used throughout choreography of different punches. Shift weight back and forth right to left foot, weight on front portion of foot.

Do not lock out knees.

After demonstration, have students practice boxer shuffle step in ready position.

6. Session One:

- (1) Shuffle, arms ready position
- (2) Alternate right/left punch
- (3) Shuffle
- (4) Alternate right jab/left jab
- (5) Shuffle
- (6) Right punch, right punch, left jab
(right combination jab)
- (7) Shuffle
- (8) Left punch, left punch, right jab
(right combination jab)
- (9) Shuffle, arms ready position
- (10) Repeat steps 4 through 9, substituting cross for jab

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- (11) Repeat steps 4 through 9, substituting hook for jab
- (12) Repeat steps 4 through 9, substituting uppercut for jab
- (13) Shuffle, arms ready position
- (14) side to side step, flurry
- (15) Simulate skipping rope
- (16) Simulate jumping rope
- (17) Cross country skier exercise
- (18) Speed bag
- (19) Jumping jack foot movement, arms simulate skipping rope
- (20) ½ jumping jack foot movement, arms simulate skipping rope
- (21) Repeat steps 14 through 20
- (22) Walk in place
- (23) Side to side step, arms extended out to sides palms up

Keep feet moving, head up at all times.

Knees don't extend past toes. Don't bend leg beyond 90° angle. Keep back straight, head up.

Arms slightly bent at elbows, no bouncing leg movements. Muscular endurance, don't

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- (24) Side to side step, bend elbows make hands into fist, bring fist to shoulder. Pump biceps.
- (25) side to side step, palms down, make small clockwise circles with hands, reverse motion of hands
- (26) Side step, shoulder press
- (27) Side step, press out to side
- (28) Speed bag, shuffle feet
- (29) Walk in place
- (30) Side to side step, flurry
- (31) Simulate skipping rope
- (32) Simulate jumping rope
- (33) Cross country skier exercise
- (34) Jumping jack foot movement, lateral arm raise movement
- (35) ½ jumping jack foot movement, lateral arm raise movement
- (36) Perform boxer shuffle, any combination punch for a period of 60 seconds

allow arms to drop.

Keeps arms slightly bent. No bouncing leg movements while performing arm circles.

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- | | |
|--|----------------------------|
| (37) Perform boxer shuffle, any combination punch for a period of 60 seconds | |
| (38) Side to side step, flurry | |
| (39) Simulate skipping rope | |
| (40) Simulate jumping rope | |
| (41) Cross country skier exercise | |
| (42) Jumping jack foot movement, lateral arm raise movement | |
| (43) ½ jumping jack foot movement, lateral arm raise movement | |
| (44) Perform boxer shuffle, any punch for a period of 30 seconds | |
| (45) Perform boxer shuffle, any punch for a period of 30 seconds | |
| (46) Walk in place | |
| (47) Side to side step, flurry | Head up, keep feet moving. |
| (48) Walk in place, slowing down pace gradually | One to two minutes. |
7. NOTE: The airboxing workout may be personalized by utilizing any of the following approved exercises in conjunction with the choreography listed above.
- (1) Jumping jacks

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- (2) ½ jumping jacks
- (3) Simulate jumping rope
- (4) Simulate skipping rope
- (5) Walk in place
- (6) Run in place
- (7) Side steps
- (8) Forward steps
- (9) Lunges
- (10) Squats
- (11) Cross country skier

NOTE: For LUNGES, SQUATS, CROSS COUNTRY SKIERS, do not extend knees past toes. Leg doesn't go beyond 90° angle, keep back straight and head up.

- (12) Biceps curls
- (13) Sun Gods / Arm circles (small - forward/backward)
- (14) Shoulder press (up)
- (15) Shoulder press (out to side)

Keeps arms slightly bent. No bouncing leg movements while performing arm circles.

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(16) Lateral arm raise, elbows bent

8. Session Two

(1) Perform pelvic tilt exercise. Laying on back arms supporting lower back, gently lift pelvis toward ceiling and lower, using abdomen muscles.
15 repetitions.

Ensure the students keep the lower back on the deck by placing their hands underneath their buttocks while performing leg lifting exercises. This will add support to the lower back, and will prevent injury.

(2) Perform bicycle crunches.
15 repetitions.

(3) Perform oblique crunches right side.
15-25 repetitions.

(4) Perform oblique crunches left side.
15-25 repetitions.

(5) Perform abdominal crunch exercise.
15-25 repetitions.

(6) Relax for 30 seconds.

(7) Perform two or three sets of session two at instructor's discretion and based on fitness level of class.

STATIONARY SHALLOW WATER WORKOUT

1. Perform Sun Gods for 1 minute.

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- a. Stand in chest or shoulder deep water, feet shoulder width apart. Arms slightly below water surface.
 - b. Extend arms out to the side, palms facing down; push downward against the water.
 - c. Rotate wrist with palms facing upward and lift pushing against the water.
 - d. Extend arms in front and together, palms facing each other.
 - e. Push arms outward against the water and then back towards the centerline.
2. Jog in place for 1 minute.
 - a. Stand in chest deep water.
 - b. Jog in place.
 3. Kick butts for 1 minute.
 - a. Stand in chest deep water.
 - b. Jog in place and bring heels to buttock.
 4. Jog in place for 1 minute.
 - a. Stand in chest deep water.
 - b. Jog in place.

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5. High knees for 1 minute.
 - a. Stand in chest deep water.
 - b. Jog in place and bring knees up to chest.
6. Jog in place for 1 minute.
 - a. Stand in chest deep water.
 - b. Jog in place.
7. One leg hop for 1 minute - 4 times each leg.
 - a. Stand in chest deep water.
 - b. Feet shoulder width apart.
 - c. Lift one leg up and hop on the other leg.
 - d. Bend the leg slightly at impact.
 - e. Switch to other leg.
8. Run fast in place for 1 minute.
 - a. Stand in chest deep water.
 - b. Run in place fast.
9. Jog in place for 1 minute.
 - a. Stand in chest deep water.
 - b. Jog in place.

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10. Cross-country skiers for 1 minute.
 - a. Stand in chest deep water.
 - b. Extend same arm and leg forward and opposite leg and arm back.
 - c. In one movement extend the same side arm and leg back and move the opposite leg and arm forward.
 - d. Repeat.
11. Gutter push-ups for 1 minute.
 - a. Stand next to the gutter facing the wall.
 - b. Cross ankles and place palms on the edge of the gutter.
 - c. Press hands downward lifting the body and extending the arms.
 - d. Lower the body by bending at the elbows.
 - e. Repeat.
12. Flutter kicks for 1 minute.
 - a. Stand next to the gutter facing the wall.
 - b. Place elbows and forearms in the gutter. Hands facing each other.

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- c. Extend feet out and back.
 - d. Flutter kick approximately 6 to 12 inches.
13. Gutter dips for 1 minute.
- a. Stand next to the gutter facing away from the wall.
 - b. Place palms on edge of gutter facing away from the wall.
 - c. Extend arms pushing downward lifting the body.
 - d. Bend at the elbows, approximately 90° angle, lowering the body.
 - e. Repeat.
14. Bicycles for 1 minute.
- a. Stand next to the wall facing away.
 - b. Extend arms over and parallel to the gutter.
 - c. Place arms in the gutter and support the body while extending the legs out.
 - d. Bring one leg back towards the chest by bending at the knee to a 90° angle. Place the other leg straight out.
 - e. Rotate by bicycling in place.

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SHALLOW WATER WORKOUT

1. Breast stroke - (down and back)
2. Push-ups - (10)
3. Dips - (10)
4. Running - (down and back)
5. Push-ups - (10)
6. Dips - (10)
7. Side stroke - (left - down and right - back)
8. Backward running - (down and back)
9. Push-ups - (10)
10. Dips - (10)
11. Crawl stroke - (down and back)
12. Push-ups - (10)
13. Dips - (10)
14. Sideways running - (down and back)
15. Push-ups - (10)
16. Dips = (10)
17. Back stroke - (down and back)

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18. Push-ups - (10)
19. Dips - (10)
20. Crawl stroke - (down and back)

N. Cool Down Stretching

1. Side to side stretch - same as warm-up
2. Tricep stretch - same as warm-up
3. Chest stretch - same as warm-up
4. Posterior shoulder stretch - same as warm-up
5. Trunk twist (seated) - same as warm-up
6. Inside hurler - same as warm-up
7. Groin stretch - same as warm-up
8. BUD/S knee stretch - same as warm-up
9. Ankle rotation- same as warm-up
10. Quadricep stretch - same as warm-up
11. Lower back stretch - same as warm-up
12. Abdominal stretch - same as warm-up
13. Calf stretch - same as warm-up

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14. Achilles tendon stretch - same as warm-up

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

SUMMARY/REVIEW

- A. State Lesson Objectives
- B. Review Major Teaching Points

Turn to cover page for objectives.

Briefly summarize.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

APPLICATION

A. See Presentation for Application.

EVALUATION: None

ASSIGNMENT: None

LESSON PLAN

JANUARY 2005

COURSE TITLE: Physical Training
Instructor Course,
P-9E-1238

CLASSIFICATION: Unclassified

LESSON PLAN NUMBER: 2.1

LESSON TOPIC: American Red Cross Sport
Safety Training

ALLOTTED LESSON TIME: 4.5 Classroom
3.5 Laboratory

INSTRUCTIONAL SUPPORT:

1 Classroom Instructor per 10 students
1 Laboratory Instructor per 10 students

INSTRUCTIONAL REFERENCES:

1. American Red Cross Sport Safety
Training Instructor's Manual
(ISBN 0-8151-0995-4)
2. American Red Cross Sport Safety
Training Audiovisual

TERMINAL OBJECTIVE:

Partially supported by this lesson topic:

- 2.0 Upon completion of this unit of instruction, the student will pass American Red Cross (ARC) Sports Safety Training within PTI without injury to personnel or damage to equipment.

Enabling Objectives:

Completely supported by this lesson topic:

- 2.1 Identify the role of a responder and how to help in an emergency.
- 2.2 Demonstrate how to check a conscious or unconscious athlete for life-threatening and nonlife-threatening conditions.
- 2.3 Identify the signals indicating breathing emergencies and how to provide care for the athlete who is having difficulty breathing or is not breathing.
- 2.4 Identify the signals indicating a heart attack and how to provide care for a person who is experiencing a heart attack.
- 2.5 Identify coaches' safety responsibilities and how they impact injury prevention for athletes.
- 2.6 Demonstrate how to care for a person who has been burned or bleeding.

INSTRUCTIONAL AIDS:

1. American Red Cross Standard First Aid Manual
2. VCR and Monitor
3. Blankets
4. Gauze, Rolls and Pads
5. Triangular Bandages
6. Splints
7. CPR Mannequin

- 2.7 Demonstrate how to care for a person who has injury to muscles, bones or joints.
- 2.8 Identify signals of sudden illness and how to give appropriate care.

CRITERION TEST:

Written knowledge test and practical skills test per American Red Cross standards.

HOMEWORK: None

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

INTRODUCTION

A. Establish Contact

Display name and lesson topic.

1. Introduce self, give rank, current job.
2. State background, schools, duty stations, etc.
3. State question and answer policy.

B. State Lesson Objectives

Turn to cover page of Lesson Plan and paraphrase objectives.

C. Establish Readiness

1. Motivating Statements

Establish importance and relevance of lesson material using personal experience or anecdote.

2. Lesson Overview

Briefly outline material to be covered.

a. Lesson Topic: American Red Cross
Standard First Aid

- b. Major Teaching Points:
- (1) Principle of First Aid
 - (2) Checking the Injured or Ill Athlete
 - (3) Breathing emergencies
 - (4) Cardiac Emergencies
 - (5) Injury Prevention
 - (6) Injuries to Soft Tissue

DISCUSSION POINT

- (7) Injuries to Muscles, Bones and Joints
- (8) Sudden Illness

RELATED INSTRUCTOR ACTIVITY

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

PRESENTATION

A. Standard First Aid

Administer American Red Cross Standard First Aid course. Refer to current ARC directives.

B. Sport Safety Training

Administer American Red Cross Sport Safety Training course. Refer to current ARC directives.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

SUMMARY

A. State Lesson Objectives

Turn to cover page for objectives.

B. Review Major Teaching Points

Briefly summarize.

APPLICATION

Students will practice segments of the Standard First Aid course under the supervision of an ARC Instructor during the course.

EVALUATION

A. Practical skills test.

B. Written test.

ASSIGNMENT

None.