

# Technical Rescuer

## Lesson One

### Health and Wellness: Injury, Death and Disease Trends

**DOMAIN:** COGNITIVE

**LEVEL OF LEARNING:** COMPREHENSION

#### **MATERIALS**

IFSTA Essentials of Fire Fighting 6<sup>th</sup> Edition; Jones and Bartlett Fundamentals of Fire Fighter Skills, 3<sup>rd</sup> Edition; National Volunteer Fire Council: *Addressing the Epidemic of Obesity in the Fire Service*; Center for Disease Control and Prevention, Workplace Safety and Health Topics: Emergency Medical Service Workers,

#### **NFPA 1006, JPR 2013 Edition**

4.2.1 Technical rescuers should comply with minimum physical fitness requirements as required by the AHJ before beginning training activities or engaging in rescue operations.

#### **Junior Member Statement:**

Junior Member training activities should be supervised by qualified instructors to assure that the cognitive and psychomotor skills are completed in a safe and non-evasive manner. While it is critical that instructors be constantly aware of the capabilities of all students both mentally and physically to complete certain tasks safely and successfully, the instructor should take every opportunity to discuss with departmental leaders and students the maturity and job awareness each participant has for the hazards associated with fire and rescue training.

**TERMINAL OBJECTIVE**

The Technical Rescuer Candidate, when given a written examination, shall correctly identify the leading causes of injury, death and disease associated with the duties of emergency responders.

**ENABLING OBJECTIVES**

1. The Technical Rescuer Candidate shall correctly describe in writing the latest trends in cause, duty and type of emergency responder death and injury.
2. The Technical Rescuer Candidate shall correctly describe in writing the latest trends in chronic diseases that affect firefighters and methods of preventing those diseases.
3. The Technical Rescuer Candidate shall correctly describe behavior modification strategies that will prevent future injuries, death and diseases in emergency responders.

# Technical Rescuer

## Lesson One

### Health and Wellness: Injury, Death and Disease Trends

#### **MOTIVATION**

Technical rescue situations are inherently dangerous and require high levels of skill and knowledge to mitigate efficiently. In addition to technical skills, it is important that a technical rescuer maintain their personal levels of health and fitness in order to execute technical rescues safely. Similar to the fire service, rescue and EMS workers face a variety of dangerous conditions while conducting emergency incident activities. It is important for technical rescuers to recognize and understand the risks involved with their chosen profession, as well as understand how improving health and fitness levels can help reduce some of those risks.

#### **PRESENTATION**

#### **ENABLING OBJECTIVE #1**

The Technical Rescuer Candidate shall correctly describe in writing the latest trends in cause, duty and type of emergency responder death and injury.

1. According to the Center for Disease Control in 2011, 27,800 EMS workers were ill or injured while on duty. The majority of reported injuries were for members who were 25-34 years of age.
2. Strains and sprains are the leading cause of injury to emergency service workers, followed by exposure to harmful substances such as potentially infectious materials.
3. The majority of on duty fatalities for fire/EMS workers are related to cardiac events, followed by deaths

related to traumatic events such as motor vehicle accidents.

4. Briefly discuss the Public Safety Officers Benefit Program and how it applies to rescue agencies.
  - a. To receive a benefit under the PSOB Act and its regulations, a claimant filing a PSOB claim must show that a “public safety officer” died or was totally and permanently disabled, due to an injury sustained in the line of duty.
  - b. An individual is considered a “public safety officer” for purposes of the PSOB Program if he or she is serving a public agency in an official capacity as a law enforcement officer, firefighter, chaplain, or member of a rescue squad or ambulance crew.

Reference: IFSTA Essentials of Firefighting, 6<sup>th</sup> Edition: pages 46-47.

Reference: Jones and Bartlett Fundamentals of Fire Fighter Skills, 3<sup>rd</sup> Edition, pages 26-29.

Reference: Public Safety Officer’s Benefit Program: “Public Agency at a Glance”:

<https://www.psob.gov/files/PublicAgency.pdf>

Reference: Center for Disease Control and Prevention: Emergency Medical Service Workers, Reports and Publications.

<http://www.cdc.gov/niosh/topics/ems/pubsfatalityinvest.html>

## **PRESENTATION**

### **ENABLING OBJECTIVE #2**

The Technical Rescuer Candidate shall correctly describe in writing the latest trends in chronic diseases that affect emergency responders.

1. Chronic illnesses are those that are long term and reoccurring. Some chronic illnesses are hereditary; however, most of them result from lifestyle choices, working in toxic atmospheres, and exposure to infected patients.
2. Technical rescuers should take extra precautions to lower their risks of the following chronic illnesses:

- a) Cardiovascular disease.
  - b) Respiratory disease.
  - c) Cancer.
  - d) Diabetes.
  - e) Obesity.
  - f) Hypertension.
  - g) Tobacco use/dependence.
  - h) Exposure related diseases (AIDS, hepatitis).
3. Discuss the *lifestyle related* elements of emergency service work that may contribute to the high risk of cardiovascular disease.
- a) Psychological job pressures.
  - b) Sleep deprivation.
  - c) Lack of exercise.
  - d) Periods of inactivity with bursts of intense activity.
  - e) Improper nutritional choices.
4. Obesity is considered to be an epidemic in the United States. Currently 33.8% of Americans are clinically obese while 34.2% are considered overweight.
5. Comparatively, prior to the 1980's only 13% of American adults were considered obese.
6. Obesity raises the risk of suffering from significant health problems such as:
- a) Metabolic syndrome.
  - b) Cardiovascular disease.
  - c) Hypertension.
  - d) Type II diabetes.
  - e) Some forms of cancer (breast, colorectal, endometrial, and kidney).
7. Additionally, the excess load on soft tissue structures such as tendons, cartilage and fascia (muscle coverings) can cause stress to these structures, which lead to musculoskeletal injuries.
8. Obesity can be identified by the following methods:
- a) Body Mass Index: > 30
  - b) Waist Circumference: Men >40 inches and Women > 35 inches
  - c) Fat accumulation around the waist is particularly harmful to overall health and is highly related to

chronic illness and death. This condition is also referred to as having an “apple shaped” body structure.

9. Hypertension is another chronic illness that affects emergency responders. Hypertension is defined as having an average systolic blood pressure greater or equal to 140 mmHg or an average diastolic blood pressure greater or equal to 90 mmHg.
10. Discuss the relationship between hypertension and obesity.
  - a) Obese individuals tend to retain more sodium. This combined with the presence of extra fatty tissue creates large amounts of resistance in the vascular system. (Think of it as friction loss in the veins and arteries.)
  - b) Increased vascular resistance requires the heart and lungs to work harder in order to move oxygenated blood throughout the body.
11. Hypertension is commonly known as the silent killer because it often occurs for years undetected. Discuss the importance of regularly monitoring blood pressure.
12. Diabetes is a chronic disease that affects a large percentage of Americans. The disease is divided into two categories:
  - a) Type I: The body does not produce insulin, which is a hormone needed to convert sugar and starches into energy for the body. This form of diabetes is often caused by genetics or unknown factors that trigger the onset.
  - b) Type II: The body does not utilize insulin properly. This type can be caused by genetics and/or lifestyle factors.
13. Discuss how being a diabetic technical rescuer can present unique challenges and/or hazards to oneself and crew members.
14. Lead the class in a discussion on cardiovascular disease and its prevalence in today’s society and emergency services.

15. Cardiovascular disease is considered to be any disease of the heart, such as the following:
  - a) Coronary heart disease.
  - b) Stroke.
  - c) Hypertension.
  
16. Explain and discuss the risk factors for cardiovascular disease. Point out the difference between modifiable risk factors and those that cannot be modified.
  - a) Factors that can be modified:
    - (1) Male age 45 or older.
    - (2) Female age 55 or older.
    - (3) Close blood relative who had a heart attack or heart surgery before age 55(male) or age 65(female).
  - b) Factors that can be modified (lifestyle):
    - (1) Cigarette smoking.
    - (2) Blood pressure > 140/90 mmHg.
    - (3) Currently taking blood pressure medication.
    - (4) Cholesterol > 200 mg/dL.
    - (5) Physically inactive (less than 30 minutes a day of physical activity on at least 3 days per week).
    - (6) Greater than 20lbs overweight.
  
17. Point out that having a high HDL (high density lipoprotein) cholesterol level, known as “good” cholesterol is considered a negative risk factor for cardiovascular disease.
  - a) High HDL = > 60 mg/dL.
  
18. Define and discuss metabolic syndrome and how it relates to the risk of cardiovascular disease.
  
19. Metabolic syndrome is diagnosed when a person has three or more of a designated list of risk factors:
  - a) Males with a waist circumference greater than 40 inches.
  - b) Females with a waist circumference greater than 35 inches.
  - c) Triglycerides of 150 mg/dL or higher.
  - d) Men with HDL levels below 40 mg/dL.
  - e) Women with HDL levels below 50 mg/dL.
  - f) Blood pressure of 130/85 or higher.
  - g) Fasting blood glucose of more than 110 mg/dL.

20. Point out that the 2013 Edition of NFPA 1582, *Standard on Comprehensive Occupational Medical Program for Fire Departments* lists metabolic syndrome as a “condition that is associated with reduced aerobic capacity that interferes with the ability to safely train to be a firefighter, as well as to safely perform certain job tasks.”
- a) Although the above note is directed towards firefighters, metabolic syndrome can pose the same limitations to technical rescuers performing physically strenuous job tasks.

Reference: IFSTA Essentials of Firefighting, 6<sup>th</sup> Edition: pages 49-52, 54, and 64.

Reference: Jones and Bartlett Fundamentals of Fire Fighter Skills, 3<sup>rd</sup> Edition, pages 28-30.

Reference: National Volunteer Fire Council: Addressing the Epidemic of Obesity in the United States Fire Service, pages 4-5, 7-10, 13-15.

[http://www.nvfc.org/files/documents/Obesity\\_Study.pdf](http://www.nvfc.org/files/documents/Obesity_Study.pdf)

Reference: United States Department of Labor, Firefighter Fact Sheet

<http://stats.bls.gov/iif/oshwc/cfoi/osar0017.htm>

Reference: NFPA 1582 *Standard on Comprehensive Occupational Medical Program for Fire Departments*, 2013 Edition.

**6.1.2, 9.4.21, A.6.12.1, A.9.4.21.1**

## **PRESENTATION**

### **ENABLING OBJECTIVE #3**

The Technical Rescuer Candidate shall correctly describe behavior modification strategies that will prevent future injuries, death and diseases in emergency service workers.

1. Identify and discuss behaviors, attitudes and traditions that influence the overall health of technical rescuers.
  - a) How many rescuers openly embrace a culture focused on safety and health?
  - b) Do members commonly support one another in efforts to improve physical fitness and diet?
  - c) How often do department members engage in improper lifting techniques?
  - d) Is the appropriate level of PPE worn on incidents with potentially infectious substances?

- e) Do members participate in annual wellness programs or receive annual physicals?
  - f) Does the department engage in regular training that involves safety and health topics?
  - g) Do organization leaders set good examples of practicing safety in their everyday functions?
  - h) Are organization leaders advocates of maintaining high levels of health and fitness among themselves and members?
2. In order for rescuers to perform efficiently and safely, they must understand their vulnerability to certain health risks.
3. Discuss why obesity is so common in today's emergency services.
- a) Nutrition environment in the fire station/ organization.
  - b) Work schedules and lack of sleep.
  - c) Limited physical activity.
  - d) Chronic stress.
4. Explain and discuss several methods of combating obesity among department members.
- a) Educate members about the role nutrition plays in preventing and reversing obesity.
  - b) Educate members on the effects obesity has on health, job performance and safety.
  - c) Encourage a culture of healthy eating in the department.
  - d) Encourage increased physical exercise both "on duty" and "off duty."
5. List and discuss methods of reducing risk of occupational injuries common to technical rescuers.
- a) Follow safety procedures.
  - b) Utilize all proper PPE.
  - c) Engage in physical activity daily.
  - d) Perform physical exercise that mimics the body movements and intensity of technical rescue tasks.
  - e) Engage in daily flexibility exercise.
6. List and discuss methods of reducing risk for LODDs attributed to heart attack.
- a) Annual physical evaluations.

- b) Educate members on how to identify cardiovascular disease risk factors.
  - c) Educate members on appropriate nutrition practices for enhanced cardiovascular health.
  - d) Include stress management training as part of safety and health initiatives.
7. Point out the effect leadership and peer influence can have in determining an organization's attitude toward health. Rescuers can have a huge impact on the health of one another through encouragement and support.
8. Criticism or belittling of those who are making positive changes regarding health should not be tolerated.

Reference: IFSTA Essentials of Firefighting, 6<sup>th</sup> Edition: pages 61, 64, and 66.

Reference: Jones and Bartlett Fire Officer Principles and Practice, 2<sup>nd</sup> Edition, Pages 26-30.

Reference: National Volunteer Fire Council: Addressing the Epidemic of Obesity in the United States Fire Service, pages 21-31, 49-51.

[http://www.nvfc.org/files/documents/Obesity\\_Study.pdf](http://www.nvfc.org/files/documents/Obesity_Study.pdf)

## **SUMMARY**

This lesson plan introduces the student to the common causes of illness, injury and fatality in emergency services. In order to formulate plans on how to best protect and enhance technical rescuer health and wellness, we must understand the main causes of these problems. The importance of maintaining overall wellness is paramount to the success of a technical rescuer, both personally and professionally.