Physical fitness training for paramedic students

Sylvia M. Alverson

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Physical Fitness Training For Paramedic Students

A Project Submitted to
Faculty Of The School Of Education
In Partial Fullfillment Of The Requiremets Of The Degree Of
Master Of Arts

In

Education: Vocational Option

By

Sylvia M. Alverson, RN, BS Voc. Ed.
San Bernardino, California
1987

Approved By: ____________________

Advisor ____________________

Committee Member ____________________
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Statement of Problem:

The purpose of the project was to develop a physical fitness training program for paramedic students that will prepare each individual for the physical demands of this profession. There was a need for curriculum in paramedic programs that addresses the specific job related physical and environmental challenges that the paramedic graduate will encounter. Many work related injuries occur because of lack of knowledge on the paramedic's part with regards of lifting heavy patients, running or turning rapidly, or carrying a variety of equipment to a variety of sites in a variety of environmental hazards.

It is believed by some experts in the field of fire science, which is a related field to paramedics, that cardiovascular problems occur in fire personnel because of the need to move quickly from a resting phase into a full mental and physical mode with no time for the body to
adjust. Paramedicine and fire science are very similar professions, therefore, a correlation can be drawn between the physical training requirements for paramedics and those already established for fire and police science programs.

Procedure:

Current literature in both Emergency Medical Care and physical training was reviewed. An analysis of the paramedic profession, task by task was done.

Established:

Programs in police and fire science were visited and physical training was observed. Veteran paramedics (N=72) of at least 2 years experience were asked to respond to a questionnaire on physical training.

Conclusion:

A physical training phase was developed and implemented into a currently existing paramedic program.
Statement of the problem

The Objective

The objective of this project was to develop a curriculum on physical fitness training for paramedic students.

Context of the problem

Many paramedics may be injured due to the many hazardous conditions that Emergency Medical Technician Paramedics (EMT-Ps) currently encounter during the course of their profession. EMT-Ps are not prepared physically to deal with moving quickly from a resting phase to a full mental and physical mode with little or no time for the body to adjust.

Rescue personnel need to be physically fit for their jobs due to the numerous unexpected circumstances which they will encounter. Because EMS personnel cannot choose their clientele, they must be well prepared to handle all sizes of patients. They must be physically fit for their jobs because in the course of one 24-hour shift they may lift a 7 foot man or a 300 lb. woman. Pregnant patients present a special kind of challenge. Care must be taken that the patient is not positioned on her back, (this would cause interference with blood flow). (Democoeur, 46, 48) A paramedic program that addresses these issues will be a
Prehospital care is a unique service. It has been called "Street Medicine", "Curbside Care", and a variety of other names to describe the environmental atmosphere in which Emergency Medical Service (EMS) experts treat patients. A paramedic must enter an unknown world everytime he/she is dispatched to a call. Treating a severely injured patient in the middle of a busy freeway, dark alley, hostile neighborhood, or angry crowd are but a few of the places where a paramedic may provide care therefore, a strong training program that also addresses physical and emotional well being to the trainee is essential.

Problem Statement

The problem is that few paramedic graduates are adequately prepared to handle the physically demanding conditions of their profession. This lack of preparation is costly in terms of Safe Medical Care administrated and injuries among paramedics.

Purpose of the Project

The purpose of the project is to produce a curriculum for paramedic students in physical fitness training which will be intergrared into a paramedic program. By producing this curriculum, the health of EMTs will be protected and the services they provide improved.
truly effective program that will round out the paramedic graduate.

The paramedic profession is exciting but often frustrating since it is impossible to choose the patients or circumstances under which they must render emergency care. This project is of great significance since adequate patient care is dependent on adequate physical fitness and endurance on the part of the health care provider.

Activities such as spinal immobilization with back boards, transportation on gurneys, or physical examination are sometimes very difficult if not impossible to accomplish on obese patients, very tall patients, tiny patients, or patients found in difficult positions or locations. Adequate balance, flexibility, agility, strength, power, and endurance are not only necessary but vital in providing competent patient care and in maintaining a state of well being on the part of the paramedic.

Kate Dernocoeur, in her book entitled, Streetsense, discusses the importance of physical fitness for prehospital care providers. The capacity to adapt to unusual situations in prehospital care is again vital in all phases of prehospital care.
Definitions

Agility

1. A person's ability to react quickly with controlled body movements. (Cureton, March, 1972)

Back Board (long)

1. A 6 foot long wooden board with 4 slots cut out for handles.
2. The board is 18 inches wide and is used by paramedics to carry or lift patients to a gurney for transportation.
3. A long back board weighs 15 LBS. (Caroline, 1983)

Back Board (short)

1. Described as above, however is limited to 32 inches in length and weighs 6 LBS. (Caroline, 1983)

Balance

1. Neuromuscular control, the muscles and nerves working together during the performance of various movements and skills. (Cureton, March, 1972)

Cardiopulmonary Resuscitation (CPR)

1. A portion of a procedure which requires 25 LBS. of pressure to be exerted by a paramedic when
performing external cardiac massage on an adult patient.
2. Pressure will vary on pediatric patients. 
   (Caroline, 1983)

Code 2 or No-Code paramedic call
1. An intermediate level call with respect to urgency.
2. A paramedic drives at a normal speed by may require a rapid of swift walk to reach the patient. 
   (Caroline, 1983)

Code 3 paramedic call
1. A high priority urgent level call in which driving is at a rate of speed which is safe and shall utilize red lights and sirens.
2. An urgent walk-run approach may be necessary in order to reach the patient and begin treatment as quickly as possible. (Caroline, 1983)

Coronary Observation radio or COR
1. A 20 LB. piece of equipment used by a paramedic to communicate with a hospital.
2. The COR must be carried from the ambulance or rescue unit to the location of the patient on all paramedic calls. (Caroline, 1983)

Drug Box
1. A plastic case which holds all drugs, and equipment necessary to treat a patient and which must be
carried to the location of the patient on all paramedic calls.

2. A drug box weighs 24 LBS. (Caroline, 1983)

Enroute Time

1. The reasonable allowed time for a paramedic to get enroute to a code 3 paramedic call. (Caroline, 1983)

Estimated Time of Arrival (ETA)

1. The estimated time necessary to drive to a given location by paramedics. (Caroline, 1983)

Flexabilty

1. Neuromuscular control, the muscles and nerves working together during the performance of various movements and skills. (Cureton, March, 1972)

Gurney

1. A piece of equipment used by a paramedic to transport a patient to a hospital setting.

2. The weight of a gurney is 65 LBS. and shall be considered in the total weight to be lifted by a paramedic. (Caroline, 1983)

Monitor/Defibrillator

1. A 21 lb. piece of equipment which must be carried by a paramedic from the rescue unit or ambulance to
the location of the patient. (Caroline, 1983)

Paramedic (EMT-P)

1. Individuals currently in training in a course of instruction which prepares him/her to function in the pre-hospital care setting rendering immediate care through radio communication established by the paramedic with a hospital’s emergency department. (Caroline, 1983)

Paramedic Call

1. A response to an emergency call from a citizen, law enforcement, fire personnel, or anyone else in the community, in which a paramedic renders basic and/or advanced life support measures in life threatening situations. (Caroline, 1983)

Physical Fitness for Paramedics

1. The capacity to adapt and respond favorably to physical effort.
2. Emotional and nutritional well being. (Cureton, March, 1972)

Power

1. Explosive force which moves the body or hands, arms, legs, or trunk in various directions. (Cureton, March, 1972)
Prehospital Care

1. Any situation in which emergency patient care is rendered to an injured or medically incapacitated individual outside an acute care hospital setting and occurs through direct voice communication established by the paramedic with a hospital emergency department. (Caroline, 1983)

Rescue

1. Light rescue, Easy patient accessibility, minimum equipment needed, usually only use of a gurney. Patient is of average height and weight.
2. Medium rescue, Use of more specialized equipment, patient accessibility may mean movement of debris, patient may be slightly larger than average height and weight.
3. Heavy rescue, Very difficult conditions, disimpaction of vehicles, moving of walls, heavy debris necessary of extremely heavy of tall patient

Strength

1. A person's ability to exert force with the hands, arms, legs, or trunk. (Cureton, March, 1972)
Assumptions

It is assumed that:

1. Physical conditioning is a standard to be achieved in Emergency Medical Services professions due to the above average physical energy expansion needed to perform prehospital medical care.

2. EMT-Ps who meet a standard of physical conditioning will be injured less than those who do not meet standards.

Delimitations

1. The curriculum to be presented in this project will be utilized primarily within paramedic programs.

2. With modification, it could be integrated into any health related program.

Limitations

The study is limited by:

1. Paramedic training programs which do not have full physical training facilities will be limited to the amount of physical training curriculum which can be integrated.
2. No paramedic program currently in existence within the State of California have a physical training curriculum established as part of their program.

Organization of the Project

The project will include the following topics

- Job description
- Target population
- Task analysis
- Course objectives
- Instructional procedures
- Measuring instruments
- Improving course efficiency/effectiveness

Summary

This introductory segment of the project, Physical Training for Paramedic Students, has identified the problem to be addressed and had described the paramedic profession in order to substantiate the current problem among paramedic graduates.
Literature Review

Introduction:

The Literature review will proceed in the following manner. First, the injury rate of EMTS will be reviewed and the causes of these injuries revealed. Next conditioning will be described and finally, a summary will be provided.

The nature of public safety jobs often reflects sudden strenuous exertion at a moments’ notice. Police and fire departments became acutely aware of high numbers of on-the-job injuries and illnesses related to coronary heart disease. Disability payments for premature cardiovascular problems were being linked to cardiovascular risk factors accrued while on the job.(Lawyer, C.H., Puterbaugh, J.S., 1983)

Puterbaugh and Lawyer took 27 firemen of all ages, ranks, and physical fitness and divided them into three groups. Group A performed one hour of unsupervised exercise three to four times per week. Group C performed one hour of supervised, structured exercise. Group B had no exercise program. After twelve weeks, group A showed an average increase of 19% during procedures to measure maximal oxygen uptake. In group B, there was an average decrease in maximal oxygen uptake of 2%.

The authors reported post alarm heart rates (heart
rates taken one minute upon returning from an emergency call) which were collected on all 27 subjects. One minute post alarm rates showed a correlation with VO2 max. In one case, a serious cardiac condition was found. The subject was the oldest fireman within the group.

This study suggests that a careful physical screening and evaluation, followed by a well supervised, on-the-job exercise program increases aerobic reserve.

While the number of subjects studied as less than ideal, the authors have suggested that a well supervised exercise program, three or four times per week may lessen the risk of heart disease occurring among fire personnel during the post alarm period.

Paramedics, like fire personnel, must quickly develop or possess good physical capabilities in order to render efficient pre-hospital emergency medical care. Paramedics must create a workable environment on each and every emergency call to which they respond. Often they must work in cramped, poorly lit, wet, cold, or other inadequate environment. The patient may be trapped by tons of material, or is a hundred feet off the road and requires significant stabilization prior to being moved. Often the least desirable alternative is what the paramedic has to adapt to, such as treating a 300 lb. woman in cardiac arrest in the cramped bathroom where she is found. Having adequate space for equipment and team members is the ideal situation. Patient size, condition, and situation will
dictate the level of care delivered to the patient. In this situation, the heavy patient was carried into a bigger area by 2 paramedics instead of the 4 which were needed due to the cramped space. That is the nature of pre-hospital care.

In an unpublished survey, the author recently asked 72 veteran paramedics with at least 2 years experience to document the average shared weight which they and their partners lifted while transporting and/or treating patients. (Alverson, unpublished material, 1987)

Paramedics (N=63) reported lifting between 200-300 lbs. 12% (N=9) reported lifting less than 200 lbs. This weight represents the patient, the gurney on which the patient is placed, the oxygen tank and other necessary equipment that may be needed. The second part of the survey had to do with responding to the question of whether or not physical training was viewed as very important or minimally important; 95% (N=69) responded in the "very important" category, 4.1% (N=3) responded in the "minimally important" category. (Alverson, unpublished material, 1987)

In 1970, the Los Angeles County Occupational Health Service began a program to monitor the health status and to increase the physical fitness of its 1,800 fire fighters. Over a 4-year period, physical examinations, including cardiac and blood laboratory studies had been completed on all participants. In addition, they were tested in job-related strength, performance, and spine flexibility.
When the evaluations of all the data was completed, exercise prescriptions and health enhancement counseling were given by exercise physiologists, and one hour per 24-hour work shift was assigned for the exercise. (Cady, L.D. 1985)

Data were not kept to determine compliance with the exercise program but physical activity was evaluated by interview and the same physiological measurements were made at each examination. By 1982 departmental averages for work related functions had increased 16%, habitual smokers decreased from 44% to 25%. High levels of work related functions were found to be inversely related to workers' compensation costs. Fire fighters with below-average work related functions experienced 2.6 times more heart disease than their above-average peers. While it would be difficult to determine the influence of any one factor on the wellbeing of the fire fighters, it would be logical to conclude that this program has had an important beneficial effect on the maintenance of a healthy work force.

In addition to a well organized exercise program, physical conditioning also requires an adequate nutritional status. A well balanced diet of protein, complex carbohydrates, low fat, and adequate water intake can assist in producing a fit body. (Alverson, 1981)

Emotional well being goes hand in hand with physical well being. The effects of stress on individuals in a profession such as paramedicine, can be enormous. The
simple fact that paramedics must work 24 hour shifts, separated from family, and respond to calls at all hours of day and night, is in itself extremely stressful. The shift work combined with the types of calls leads to rapid "burn out" symptoms. If stress can be recognized and treated early, the paramedic can have a longer professional life professional life and also a more fulfilling personal one.(Dernocoeur, Streetsense, p.173-189) In addition, physicians are strongly convinced of the beneficial relationship between hard exercise and a positive frame of mind. (L.E. Lamb, 1986)

As a training program for EMS personnel it becomes imperative that we address the total individual, not just his/her knowledge base of treatment and intervention of emergencies but also how to keep physically fit. In order to accomplish this goal, a physical training program has been developed. All individuals admitted into the program must be assessed in the following areas; balance, flexibility, agility, strength, power, and endurance. Pre-hospital care requires a high level of physical fitness. This can be achieved through participation in regular and effective physical training.
Methodology

A complete curriculum has been developed to deal with the problem of physical fitness among paramedics working for private and public agencies. Paramedic students will be assessed for physical capabilities through use of developed criteria. The student will be taken through a series of didactic sessions and skills performances and will be evaluated in both areas. Classroom material has been developed to achieve the specific results and criteria has been established to insure the continuous "improvements of course effectiveness", (Mager, R.F., 1967).

Two class sites were visited that have physical fitness programs intergrated into the curriculum. One was a fire science academy and the other a police academy course. Once the appropriate data was collected, it would be developped into a complete curriculum packet using appropriate standard format. The use of paramedic equipment will be necessary in establishing the amout of daily lifting and the amount of total weight carried.

A complete picture of the various types of paramedic calls and the various levels of responses with respect to physical activity has been discussed, demonstrated, and evaluated. The students will gradually be taken through
progressive physical activity to build endurance.

This curriculum was researched, developed and implemented in October 1987. The cost of this project was in terms of the author's time, and printing of materials. All physical training equipment is available where the program is to be implemented. All paramedic equipment is to be available at the same location.

Calendar of Events

The events of this research proposal will occur on the following dates and in the following order:

Feb 87  EMT-P Physical Training Pilot Program
Mar 87  Submit Proposal to University
Mar 87  Evaluate Pilot Program
Apr 87  Continue Research of Physical Training
May 87  Resubmit Proposal to University
June 87  Conduct on site visits to physical training programs of Police/Fire programs
June 87  Resubmit Proposal to University
June-Sept 87  Data Collection
Sept 87  Analyse Data
Sept 87  Validate Instruments
Oct  87  Implement Training Program
JOB DESCRIPTION

Vocation: EMERGENCY MEDICAL TECHNICIAN-PARAMEDIC

A paramedic performs advanced emergency medical care on patients outside the hospital setting. He/she maintains verbal communication via radio with his/her assigned hospital emergency room.

The EMT-P performs his/her work in various uncontrolled environmental settings which may often be hazardous. He/she works 24-hour shifts and responds to an average of 10-18 calls per shift. He/she must be able to adjust to any situation and work quickly as well as efficiently.

TARGET POPULATION

Physical Characteristics: Male or female, 19 to 40 years of age, average to above average physical condition.

Education: High school graduates, certified and actively employed as an Emergency Medical Technician I for no less than 6 months, paid or volunteer. Must have successfully passed written and oral examinations for entrance into the Paramedic Program.
Motivation: Desire to grow professionally and to perform advance level patient care under the optimum personal physical condition.

Attitudes/Biases: Tend to show a great dependency on emergency calls which stress the limits of their physical and mental capabilities. The very nature of emergency calls, variety of critical and number, often becomes the focal point for stress and symptoms of "burnout". Profession attracts a small number (less that 10%), of women.

**TASK ANALYSIS**

<table>
<thead>
<tr>
<th>PHYSICAL TASK</th>
<th>FREQUENCY</th>
<th>CONSIDERATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performs CPR</td>
<td>1 PER 24 HR.</td>
<td>Upper body/back</td>
</tr>
<tr>
<td>Lifts Gurney</td>
<td>10-18 24 HR.</td>
<td>Upper body/back/legs</td>
</tr>
<tr>
<td>Lifts Patient</td>
<td>10-18 24 HR.</td>
<td>Upper body/back/legs</td>
</tr>
<tr>
<td>Lifts Radio</td>
<td>10-18 24 HR.</td>
<td>Upper body</td>
</tr>
<tr>
<td>Lifts Difibrillator</td>
<td>10-18 24 HR.</td>
<td>Upper body</td>
</tr>
<tr>
<td>Applies Backboard</td>
<td>10-18 24 HR.</td>
<td>Upper body</td>
</tr>
<tr>
<td>Light Rescue</td>
<td>4-6 24 HR.</td>
<td>Upper body/back/legs</td>
</tr>
<tr>
<td>Medium Rescue</td>
<td>4-6 24 HR.</td>
<td>Upper body/back/legs</td>
</tr>
<tr>
<td>Heavy Rescue</td>
<td>4-6 24 HR.</td>
<td>Upper body/back/legs</td>
</tr>
</tbody>
</table>
GOAL I: To assess the physical fitness of the participant

OBJECTIVE: The student will demonstrate cardiovascular status.
CONDITION: The student will be given a definition and demonstration of Cureton's Breath-Holding Test.
CRITERION: The student must be able to hold his/her breath for at least 30 seconds upon conclusion of test.

OBJECTIVE: The student will demonstrate cardiovascular status.
CONDITION: The student will be given a definition and demonstration of Cooper's 12-Minute Walk/Run Test.
CRITERION: The student will rank in the GOOD or EXCELLENT category for age.

GOAL II: To define Prudent Heart Living

OBJECTIVE: The student will be able to identify risk factors pertinent to EMT-PS.
CONDITION: The student will be given a list of terms and definitions.
CRITERION: The student will achieve 80% proficiency on a written or oral examination.

OBJECTIVE: The student will be able to identify the major components of good nutritional status for EMT-PS.
CONDITION: The student will achieve 80% proficiency on a written or oral examination.

GOAL III: To define stress as it relates to EMT-PS

OBJECTIVE: The student will be able to define stress.
CONDITION: The student will be given a list of terms and definitions.
CRITERION: The student will achieve 80% proficiency on a written or oral examination.

OBJECTIVE: The student will be able to list signs and symptoms of stress.
CONDITION: The student will be given a list of signs and symptoms of stress.
CRITERION: The student will achieve 80% proficiency on a written or oral examination.

OBJECTIVE: The student will be able to identify causes of stress.
CONDITION: The student will be given a list of causes of stress.
CRITERION: The student will achieve 80% proficiency on a written or oral examination.

OBJECTIVE: The student will be able to identify preventive measures for stress.
CONDITION: The student will be given a list of preventive measures for stress.
CRITERION: The student will achieve 80% proficiency
on a written or oral examination.

GOAL IV: To demonstrate safe and proper techniques in neuro-muscular fitness in EMT-PS.

OBJECTIVE: The student will be able to demonstrate proper warm-up techniques and safety aspects.

CONDITION: The student will be given demonstrations of warm-up and safety techniques.

CRITERION: The student will be able to give a return demonstration with 100% proficiency.

Objective: The student will be able to identify major muscle groups associated with daily tasks performed by EMT-PS.

CONDITION: The student will be given a list of major muscle groups associated with tasks performed by EMT-PS.

CRITERION: The student will achieve 80% proficiency on a written or oral examination.

OBJECTIVE: The student will be able to demonstrate exercises to improve the major muscle groups associated with tasks performed by EMT-PS.

CONDITION: The student will be given demonstrations of exercises to improve the major muscle groups associated with tasks performed by EMT-PS.

CRITERION: The student will be able to give a return demonstration with 100% proficiency.

OBJECTIVE: The student will be able to demonstrate
cardiovascular and muscular conditioning.

CONDITION: The student will be given demonstrations in strength, endurance, and flexibility.

CRITERION: The student will be able to give a return demonstration with 100% proficiency.

OBJECTIVE: The student will be able to demonstrate self-defense techniques for EMT-PS.

CONDITION: The student will be given demonstrations of self-defense techniques.

CRITERION: The student will be able to give a return demonstration with 100% proficiency.
LESSON PLAN: I. ASSESS CARDIOVASCULAR STATUS

SESSION 1. Introduction to Physical Training

Time: 2.0 Hours

KEY POINTS:

A. Assessment Questionnaires
B. Goals/Objectives of Physical Training
C. Grading System
D. Definition of Physical Training Terms

STUDENT ACTIVITIES:

A. Complete Physical Assessment Questionnaires
B. Participate in small group discussions of benefits of physical fitness in the delivery of Emergency Medical Care.
C. Present examples of physically demanding Emergency Medical calls which they have personally experienced.
The goal of a physical training program should be to achieve optimum or near optimum fitness so life can be enjoyed to the fullest. A physical training program for paramedic students is important because EMT-PS are often not prepared to deal with moving quickly from a resting phase to a full mental and physical mode with little or no time for the body to adjust. Few paramedic graduates are adequately prepared to handle the physically and emotionally demanding conditions of their profession.

Many paramedics may be injured due to the many hazardous conditions that EMT-PS currently encounter during the course of a 24-hour shift. Rescue personnel need to be physically fit for their jobs due to the numerous unexpected circumstances which they will encounter. Because EMT-PS cannot choose their clientele, they must be well prepared to handle all sizes of patients as well as all types of situations. They must be physically fit for their jobs because in the course of one 24-hour shift they may carry a 7 foot man or a 300 lb. woman.

Activities such as spinal immobilization with backboards and cervical collars, positioning, lifting, and carrying patients on gurneys or physical examinations are often very difficult if not impossible to accomplish on the obese patients, very tall patients, tiny patients, or patients found in difficult positions or locations.
Adequate balance, flexibility, agility, strength, power, and endurance are not only necessary but vital in providing competent patient care and maintaining a state of well-being on the part of the paramedic. Prehospital care is a unique service. It has been called "STREET MEDICINE", "CURBSIDE CARE", and a variety of other names to describe the environmental atmosphere in which EMT-PS must render emergency medical care. An EMT-P must enter an unknown world every time he/she is dispatched to a call. Treating a severely injured patient in the middle of a busy freeway, dark alley, hostile neighborhood, or dodging bullets from an angry crowd are but a few of the places where a paramedic may provide care.

The prime motivating factor for physical fitness is pride and a desire for personal improvement. Motivation is the desire to look, think, and perform better each day. For the EMT-P, a strong motivator can be the realization that his/her life could well depend on whether or not he/she is physically fit.

PROGRAM GOALS: All students will receive a copy of the course goals and objectives. There are 4 basic categories; physical assessment of the participant, prudent heart living, stress management, techniques for neuro-muscular fitness. The benefits of participating in a regular exercise program are; more energy, more active leisure time, greater ability to handle stress, less depression, less anxiety, less physical complaints, more efficient
digestive process, better self image, more self confidence, more attractive physical appearance, more bone stability and strength, slower aging process, more restful sleep, better concentration, better recovery time, and for women, it has been reported that exercise will help in achieving an easier pregnancy and childbirth.

MEDICAL EVALUATION: Prior to engaging in the physical training aspect of the Paramedic Program, the student will have a thorough medical examination by a physician. Only a doctor can determine if the student is able to participate fully in the training. Since this course has been determined to be a required portion of the Paramedic Program, the student must be able to participate fully.
ASSESSMENT QUESTIONNAIRE

NAME________________________

AGE_______
SEX_______
HEIGHT____
WEIGHT____
PULSE____
B/P_______

Please indicate in the space below the type of exercise program you have been involved in during the last six months;____________________________________________________
____________________________________________________
____________________________________________________

Is this on a weekly basis?__________________________
monthly basis?____________________________________
daily basis?____________________________________

Are you a smoker?_______
nonsmoker?_______

Are you currently under a doctor’s care?____________
If "yes" will the condition prevent you from completing the
physical training or didactic phase of the program?

Is your Physician Clearance form on file with the EMS
DEPARTMENT?

Is your T.B. SKIN TEST results on file with the EMS
DEPARTMENT?

Are you under any
medications?

Are you on any special
diet?
PARAMEDIC PROGRAM

PHYSICAL TRAINING GRADING SYSTEM

There are 5 categories within the grading system. Each category is worth 20% of your final grade.

I. Attitude: An individual involved in EMS must maintain a high level of physical fitness. He/she may come face to face with situations which make great demands on his/her physical capacity. Physical fitness may mean the difference between life and death, not only for the patient but for the paramedic himself/herself. The paramedic who lacks the muscular strength and endurance necessary to successfully cope with all types of situations is not prepared to adequately carry out his/her duties. The paramedic student understand the importance of this training, and have the motivation necessary to demonstrate an acceptable level of cooperation and participation.

ACCEPTABLE ATTITUDE= COOPERATIVE, HELPFUL, FOLLOWS DIRECTIONS EASILY

MARGINAL ATTITUDE= FREQUENTLY TARDY, ABSENT, DOES NOT PARTICIPATE TO HIS/HER FULL CAPACITY

UNACCEPTABLE ATTITUDE= UNCOOPERATIVE, FREQUENTLY TARDY, ABSENT, UNWILLING TO PARTICIPATE

II. Attendance: Student is allowed 2 excused (defined as either pre-arranged with instructor, physician's excuse, or
extreme emergency) absences and/or 2 excused tardies (same definition as above).

III. Comprehensive Written Examination: Must receive a score of 80% or above to receive full 20% credit; exam will cover Prudent Heart Living, Stress Management, Nutrition, and Exercise terms and definitions.

IV. Comprehensive Skills Examination: Must achieve the acceptable level for age, height, weight, set by instructor and demonstrate proper safety and warm-up measures in the following categories; Agility, Balance, Cardiovascular Endurance, Flexability, Muscular Strength and Endurance.

V. Class Logistics:
Dress= Paramedic Exercise Uniform must be worn
Food/Drink=Eating and drinking will not be allowed during exercise sessions. It is recommended that students not eat at least 20 minutes prior to attending physical training. Alcoholic beverages are strictly prohibited on campus. Any individual violating this campus rule shall be subject to dismissal.
Personal Appearance: Students must be neat and clean in appearance.
Class Notes: Students must keep neatly written or typed class notes for the lecture sessions. Must be evaluated by
instructor at the conclusion of the course, prior to the final examinations.

GRADE DISTRIBUTION:
A=95-100%
B=86-94%
C=80-85%
D=79-70%
F=69% or below
Definitions

Agility

1. A person's ability to react quickly with controlled body movements. (Cureton, March, 1972)

Back Board (long)

1. A 6 foot long, wooden board with 4 slots cut out for handles.
2. The board is 18 inches wide and is used by paramedics to carry or lift patients to a gurney for transportation.
3. A long back board weighs 15 LBS. (Caroline, 1983)

Back Board (short)

1. Described as above, however is limited to 32 inches in length and weighs 6 LBS. (Caroline, 1983)

Balance

1. Neuromuscular control, the muscles and nerves working together during the performance of various movements and skills. (Cureton, March, 1972)

Cardiopulmonary Resuscitation (CPR)

1. A portion of a procedure which requires 25 LBS. of pressure to be exerted by a paramedic when
performing external cardiac message on an adult patient.

2. Pressure will vary on pediatric patients.
   (Caroline, 1983)

Code 2 or No-Code paramedic call

1. An intermediate level call with respect to urgency.
2. A paramedic drives at a normal speed by may require a rapid of swift walk to reach the patient.
   (Caroline, 1983)

Code 3 paramedic call

1. A high priority urgent level call in which driving is at a rate of speed which is safe and shall utilize red lights and sirens.
2. An urgent walk-run approach may be necessary in order to reach the patient and begin treatment as quickly as possible. (Caroline, 1983)

Coronary Observation radio or COR

1. A 20 LB. piece of equipment used by a paramedic to communicate with a hospital.
2. The COR must be carried from the ambulance or rescue unit to the location of the patient on all paramedic calls. (Caroline, 1983)

Drug Box

1. A plastic case which holds all drugs, and equipment necessary to treat a patient and which must be
carried to the location of the patient on all paramedic calls.

2. A drug box weighs 24 LBS. (Caroline, 1983)

Enroute Time

1. The reasonable allowed time for a paramedic to get enroute to a code 3 paramedic call. (Caroline, 1983)

Estimated Time of Arrival (ETA)

1. The estimated time necessary to drive to a given location by paramedics. (Caroline, 1983)

Flexibility

1. Neuromuscular control, the muscles and nerves working together during the performance of various movements and skills. (Cureton, March, 1972)

Gurney

1. A piece of equipment used by a paramedic to transport a patient to a hospital setting.

2. The weight of a gurney is 65 LBS. and shall be considered in the total weight to be lifted by a paramedic. (Caroline, 1983)

Monitor/Defibrillator

1. A 21 lb. piece of equipment which must be carried by a paramedic from the rescue unit or ambulance to
the location of the patient. (Caroline, 1983)

Paramedic (EMT-P)

1. Individuals currently in training in a course of instruction which prepares him/her to function in the pre-hospital care setting rendering immediate care through radio communication established by the paramedic with a hospital’s emergency department. (Caroline, 1983)

Paramedic Call

1. A response to an emergency call from a citizen, law enforcement, fire personnel, or anyone else in the community, in which a paramedic renders basic and/or advanced life support measures in life threatening situations. (Caroline, 1983)

Physical Fitness for Paramedics

1. The capacity to adapt and respond favorably to physical effort.

2. Emotional and nutritional well being. (Cureton, March, 1972)

Power

1. Explosive force which moves the body or hands, arms, legs, or trunk in various directions. (Cureton, March, 1972)
Prehospital Care

1. Any situation in which emergency patient care is rendered to an injured or medically incapacitated individual outside an acute care hospital setting and occurs through direct voice communication established by the paramedic with a hospital emergency department. (Caroline, 1983)

Rescue

1. Light rescue, Easy patient accessibility, minimum equipment needed, usually only use of a gurney. Patient is of average height and weight.

2. Medium rescue, Use of more specialized equipment, patient accessibility may mean movement of debris, patient may be slightly larger than average height and weight.

3. Heavy rescue, Very difficult conditions, disimpaction of vehicles, moving of walls, heavy debris necessary of extremely heavy of tall patient

Strength

1. A person's ability to exert force with the hands, arms, legs, or trunk. (Cureton, March, 1972)
LESSON PLAN: II. DEFINE PRUDENT HEART LIVING

SESSION 2. IDENTIFYING RISK FACTORS

Time: 1.0 Hour

KEY POINTS:

A. Progressive Heart Changes
B. Risk Factors That Can Not Be Changed
C. Risk Factors That Can Be Changed
D. Contributing Risk Factors

STUDENT ACTIVITIES:

A. Participate in Discussion of Risk Factors
B. Keep Neat Handwritten or Typed Notes on Material

SESSION 3. IDENTIFYING GOOD NUTRITION

Time: 1.0 Hour

KEY POINTS:

A. The Importance of Good Nutrition
B. Protein
C. Carbohydrates
D. Fats
E. Vitamins/Minerals/Water
F. Desirable Weight Ranges

STUDENT ACTIVITIES:

A. Identify foods to use liberally
B. Identify foods to use in smaller amounts
C. Locate desirable weight on chart
D. keep neat handwritten or typed notes on Material
Prudent heart living is a life style that minimizes the risk of future heart disease. This life style includes weight control, physical fitness, sensible dietary habits, avoidance of cigarette smoking, reduction of blood fats (such as cholesterol and triglycerides) and control of high blood pressure.

Long before the function of the heart muscle is impaired, there exists an asymptomatic period when risk factor modification may halt or reverse the process. The inner portion of the arterial wall becomes thickened by the deposition of fatty deposits and eventually calcium. The results is a gradual narrowing of the arterial lumen that eventually may lead to complete occlusion and can be compared to the gradual build up of lime deposits that plug a pipe. Injury to the heart muscle occurs because of this decrease of blood flow, creating an imbalance between the demand of the heart muscle for oxygen and the ability of the narrowed coronary artery to meet that demand.

The American Heart Association has researched the causes of this blood vessel disease in this and other countries and a number of factors consistently turned up. This lead to the "Risk Factor" concept.

RISK FACTORS THAT CANNOT BE CHANGE

Heredity: A history of premature Coronary Heart Disease in
siblings or parents suggests an increased susceptibility that may be a genetic factor.

Sex: Women have a lower incidence of coronary heat disease prior to menopause. The incidence increases significantly in postmenopausal.

Race: Black American have approximately a 45% greater chance of having high blood pressure (a contributor to heart attack and stroke) than whites.

Age: The death rate from coronary heart disease increases with age. However, nearly one in four deaths occur in persons under age 65.

RISK FACTORS THAT CAN BE CHANGED

CIGARETTE SMOKING: The heart attach death rate among people who do not smoke is considerably lower than for people who do smoke. For these people who have given up smoking the death rate eventually declines almost to that of those people who have never smoked.

HIGH BLOOD PRESSURE: A major risk factor of stroke and heart attack is high blood pressure. There is no specific symptoms associated with high blood pressure. It can be detected by a simple painless test. A person with mild elevations of blood pressure often begins treatment with a program of weight reduction, if overweight, and salt (sodium) restriction before drugs are recommended.

BLOOD CHOLESTEROL LEVELS: Too much cholesterol can cause a buildup of plaque on the wall of the arteries, causing them to become narrower, not allowing the blood to pass through
leading to heart attack and stroke. A doctor can measure the amount of cholesterol in the blood by a simple test. The body accumulates cholesterol both through diet and by manufacturing it, a low in saturated fat and cholesterol will help lower the level of blood cholesterol if it is too high. Medications are also used to maintain the cholesterol levels within the normal range.

DIABETES: Diabetes is a disease associated with insulin insufficiency and most often seen in persons who are overweight. The pancreas, which is responsible for manufacturing insulin is stressed by the increase of weight and carbohydrates. Once detected, diabetes can be controlled with diet, exercise, and medication in oral or injection form.

CONTRIBUTING RISK FACTORS:

OBESITY: Obesity simply results from eating too much and exercising too little. It places a heavy burden on the heart. In addition, obesity is associated with coronary heart disease primarily because of its influence on blood pressure, blood cholesterol and precipitating diabetes. To reduce weight, a low-calorie diet under physician management is recommended.

LACK OF EXERCISE:

Although lack of exercise has not been clearly established as a risk factor for heart attack, when combined with overeating, it may lead to excess weight, which is clearly a contributing factor.
STRESS:

Stress will be discussed in detail in a later session.
THE IMPORTANCE OF GOOD NUTRITION:

Proper nutrition is essential for good health because we live on our food and liquid intake. A well-balanced diet not only supplies energy but also the growth and repair material needed by the body. The quality and quantity of food consumed is the most important single factor in achieving balanced caloric intake and caloric expenditure. Because exercise places a greater demand on the body's resources, proper nutrition is essential. Certain foods produce chemical changes in the brain that can wake you up or make you sleepy. High protein food like fish, meat, eggs, dairy products cause the body to utilize adrenaline and puts it on full alert-energized. The indolamine pathway, on the other hand, has a calming, sedative effect on the body. It is triggered by high-carbohydrate foods, such as pasta, salads, fruits, and rich desserts. These initially produce a short surge of energy, but then encourage sleepiness due to the high amount of carbohydrates in the blood. Eating a balance of protein and carbohydrates together helps your body utilize both better.

Lilian Cheung, D.Sc., R.D., acting director of the Nutrition and Fitness Information Service, Harvard Center for Health Communication, recommends four or five small meals a day rather than two or three large ones due to the
long waits between meals which may cause the blood sugar to become too low.

Protein: Protein is absolutely essential to a proper diet because it is the basic material of all muscle, gland and nerve tissue. The body needs a daily supply of protein to build new tissue and to replace tissues that are wearing out. The chief sources of protein are lean meat, fish, poultry, eggs, mild cheese, nuts, and dried beans.

CARBOHYDRATES: Carbohydrates are the great energy-producing foods and occur chiefly as sugars and starches. Energy requirements must be considered in a diet as well as essential nutrients. After digestion, sugar is absorbed in the blood. The excess over current needs is converted to glycogen and can be stored in the liver and in muscle tissue. The remainder is converted to fat. The principal sources of carbohydrates are: sugar, cereal, rice, bread, and certain vegetables (potatoes, carrots, corn), noodles and spaghetti. More specifically, complex carbohydrates such as fresh fruits and vegetables, whole wheat breads, whole grains and cereals are not absorbed as rapidly as simple sugars (candies, cakes). Complex carbohydrates also tend to have more important vitamins and minerals.

FATS: Fats provide more that twice the energy of either
protein or carbohydrates. After digestion they are absorbed and oxidized to produced energy. Amounts in excess of current needs may be stored in the body as fat or converted to carbohydrate and stored as glycogen. Fats are derived from both animal and vegetable sources such as vegetable oils, butter, margarine, bacon, cream, nuts and fat meat.

During recent years, numerous studies have been made concerning the effects of cholesterol in human nutrition. Cholesterol is a fatty substance manufactured by the body and is present in many foods of animal origin. It performs many useful functions in the body, but in excessive amounts it may accumulate in the walls of the blood vessels and form deposits of plaques. These plaques tend to clog the arteries and increase the incidence of heart attacks and strokes. This type of fat is referred to as saturated and is usually of animal origin. Foods that are high in cholesterol include egg yolk, shell fish, liver, lard, pork, and other animal fats. Unsaturated fats usually of plant origin, actually tend to lower blood cholesterol. The principal unsaturated fats which are helpful to the human body are corn, soybean, safflower oils, and margarines.

BASIC FOUR: Nutrition experts recommend that daily dietary requirements be met by selecting foods from the following groups which have become known as the BASIC FOUR.

1. Milk Group One pint of fortified skim milk or
buttermilk. It can be taken as a beverage or used in the preparation of other food.

2. Meat Group Lean beef, veal, poultry, fish, and eggs. (Two to three servings per day.)

3. Vegetable-fruit Group Fruits and green or yellow leafy vegetables. (Four or more servings per day, one of which should be citrus fruit or tomatoes. Also to include one raw vegetable.

4. Bread-Cereal Group Whole grain, enriched or restored bread and cereal. One serving of cereal and three servings of bread per day.

Vitamins and Minerals: The ideal way to get vitamins and minerals is by eating a well balanced diet and drinking 8-10 glasses of water per day. Leafy, green vegetables are good sources of minerals, while low-fat dairy products are great calcium suppliers. Iron-rich foods include lean meats, spinach, enriched whole grains, and prunes. Not getting the proper amounts of crucial vitamins and minerals is a major source of fatigue. Iron deficiencies lead to fatigue and anemia. Zinc and Vitamin B is needed for the development of normal blood cells. Low potassium and sodium can cause muscle weakness and tremors. A multi-vitamin supplement can be taken daily if one is concerned about the amount of vitamins and minerals he or she receives.
DESIABLE WEIGHT RANGES: An individual's normal weight is based on several factors; height, age, body build, and sex. The best weight for an individual is one at which he/she feels well, looks well, is alert, and resists fatigue or infection. Obesity is a major health problem in America today. Obesity is defined as an excess of body fats in amounts of more than 15% above normal weight based on height, age, body build, and sex. In addition to suffering from a variety of ailments, the obese person generally presents a poor personal appearance. It is difficult for the paramedic to present a professional appearance when he/she is overweight. An obese person is frequently tired and sluggish, short of breath and suffers from vertigo and heart palpitation. An effective diet to correct overweight should be balanced and in conformity with good nutritional practices. The same guidelines should be used in weight gain goals. Medical supervision is recommended in both instances. Ask the student to locate his/her ideal weight using the attached chart.
I. Introduction: Many students pack a lunch during the paramedic program. A lunch you take from home can be tasty, nutritious meal, or an unappetizing mess stuffed in a sack. It depends on how you put it together. First, have a variety of containers on hand for both hot and cold items. Tupperware, empty margarine containers, insulated thermos jars for cold of hot food, small containers for salad dressing, peanut butter, condiments. Buy several "cold packs"—the kind you can put in the freezer and then place in the lunch box to keep items cold.

If you have access to a refrigerator and/or a microwave at your work place, the possibilities are unlimited.

II. Entrees—the typical lunch "entree" is a sandwich, and there can be a good variety here. Skip the high fat lunch meats and try some other ideas:

- Water-pack tuna
- Peanut butter and banana
- Sliced turkey
- Peanut butter and lettuce
- Sliced chicken
- Avocado and tomato
- Tomato and lettuce

Sandwich accompaniments include tomatoes, lettuce, raw spinach, pickles, sliced onion, bell pepper, thin sliced
cucumber, alfalfa sprouts.

Instead of a sandwich, pack a regular entree in a container for hot items:

- Lentil stew
- Chili
- Baked beans
- Pinto beans
- Lasagna
- Spaghetti
- Tuna noodle casserole
- Scalloped potatoes

III. Vegetable Accompaniments

- Carrot sticks
- Celery sticks
- Zucchini sticks
- Cucumber sticks
- Cherry tomatoes
- Raw broccoli
- Raw cauliflower
- Cold cooked asparagus
- Radishes
- Green onions
- Three-bean salad
- Potato salad
- Carrot and raisin salad

On cold days, a good vegetable soup.

IV. Beverages

Fruit juice, low fat of skim milk, water. In hot weather, freeze fruit juice in the can or carton and use to help keep lunch cold. It will thaw in time to drink.
V. Desserts

Fresh fruit is the best. Choose apples, bananas year round. Take advantage of seasonal fruits like cherries, apricots, peaches, melons, etc. Don't skimp on the portion—take 2. You can always save it. Oatmeal cookies, dried fruit, nuts, popcorn balls can be used a special treats.
Fast Food Restaurants

Statistics: Americans spend 1/3 of every food dollar eating out. Fast food restaurants account for 45% of all eating places in the U.S. and we spend 40% of "eating out" money at fast food restaurants according to the U.S.D.A. From 1978-1979 fast food chains spent an average of $346 per restaurant seat on advertising and promotion.

Reasons to eat out: The National Restaurant Association August 1982 Survey of 1000 diners gave these reasons, beginning with convenience, enjoyment, lack of time, celebration, traveling, business meetings, shopping and other reasons.

Problems with fast food selection:

High Calorie Content of Fast Food Meals
An average of 900-1800 calories per meal—33-66% of the daily calories for men and an average of—45-90% of the daily calories for women. McDonald's and other chains claim that their meals provide 1/3 or more of the U.S RDA for some of the vitamins and minerals. They don't mention that it takes about 1/2 of a day's worth of calories to get 1/3 of the nutrients.

High Fat Content of Fast Food Meals
Most meals provide an average of 40-50% of the calories as fat. The recommended daily fat percentage is 30% of the total calories. Also, much of the fat in fast food
is saturated—beef and lard-based shortening or highly saturated palm and coconut oil. Saturated fat is associated with raised blood cholesterol.

High Sodium (Salt) Content of Fast Food Meals
The average meal ranges from 1,000-2,515 mg of sodium. Since the Food and Nutrition Board of the National Academy of Sciences/National Research Council recommends 1,000-3,000 milligrams per day as a safe and adequate amount, on fast food meal alone provides more than its share of the daily amount. Also, it's rather interesting that McDonald's lists sodium in grams instead of milligrams as everyone else does. Which sound more alarming, 1,000 milligrams or 1 gram of sodium in a Big Mac?

Nutrient Analysis of Fast Food Meals
High fat
High Protein
Moderate iron and calcium
Low fiber due to presence of refined carbohydrates primarily
Low vitamins A and C
Low trace minerals
Low folic acid, biotin, pantothenic acid, copper (Consumer Reports analysis, 1975)
Low magnesium, vitamins E and B-6 for the amount of
Summary: There’s no disputing that fast food do provide some nutrients. The problem is that these nutrients come with a heavy price—far more fat, sodium and calories that most of would want of need. Two suggestions are to eat at fast food places infrequently and/or supplement a fast food meal with fruit, vegetable pieces of some other unrefined complex carbohydrate choice.

Physical Training for Paramedics

Stay away from fast foods the food is costly, high in calories and may not supply you with sufficient vitamins.

Listed below are examples of "Fast Food Calories".

<table>
<thead>
<tr>
<th>Baskin-Robbins</th>
<th>Taco Bell</th>
</tr>
</thead>
<tbody>
<tr>
<td>One scoop 2 1/2 oz sugar cone</td>
<td></td>
</tr>
<tr>
<td>Chocolate Fudge</td>
<td>229 One Taco</td>
</tr>
<tr>
<td>French Vanilla</td>
<td>217 Tostada</td>
</tr>
<tr>
<td>Rocky Road</td>
<td>204 Order of Frijoles</td>
</tr>
<tr>
<td>Butter Pecan</td>
<td>195 Enchirito</td>
</tr>
<tr>
<td>Jamaica Almond Fudge</td>
<td>190 Burrito</td>
</tr>
<tr>
<td>Chocolate Mint</td>
<td>189 Bellburger</td>
</tr>
<tr>
<td>Jamaica</td>
<td>182</td>
</tr>
<tr>
<td>Fresh Strawberry</td>
<td>168 MacDonald’s</td>
</tr>
<tr>
<td>Fresh Peach</td>
<td>165</td>
</tr>
<tr>
<td>Mango Sherbet</td>
<td>132 Egg McMuffin</td>
</tr>
<tr>
<td>Banana Daiquiri</td>
<td>129 Hamburger</td>
</tr>
<tr>
<td></td>
<td>Cheese Burger</td>
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<tr>
<td>Burger King</td>
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<tr>
<td></td>
<td>Quarter Pounder</td>
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<tr>
<td></td>
<td>with cheese</td>
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<tr>
<td>The &quot;Whopper&quot;</td>
<td>606 Big Mac</td>
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<tr>
<td>The &quot;Whaler&quot;</td>
<td>744 Filet-O-Fish</td>
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<tr>
<td>French Fries</td>
<td>214 French Fries</td>
</tr>
<tr>
<td>Large Shake</td>
<td>332 Apple Pie</td>
</tr>
</tbody>
</table>

54
Hamburger  252  Chocolate Shake  317
Cheese Burger  305  Vanilla Shake  322
Hot Dog  291  Strawberry Shake  315

Colonel Sanders' Fried Chicken

Dairy Queen

15 Piece Bucket  3300

Drumstick  220  Average Banana Split  347

"Dinner" (3pcs Chicken Super Brazier  901
cole slaw, mashed Chicken Snack  342
potatoes, gravy, and
roll)  980

Alcoholic Beverages!!!!

100-proof 1 1/2 oz.  124
Wine, Table 3 1/2 oz.  87
Beer 4.5% alcohol  151
12 oz.
### Desirable Weight Ranges

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<th>Small</th>
<th>Medium</th>
<th>Large</th>
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<td>123-149</td>
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PHYSICAL TRAINING FOR EMT-PS

LESSON PLAN: III. UNDERSTANDING STRESS

SESSION 4. STRESS AND THE EMT-P

Time: 2.0 Hours

KEY POINTS:

A. Define Stress
B. Identify Signs and Symptoms
C. List Causes for Stress
D. List Preventive Measures

STUDENT ACTIVITIES:

A. Complete Life-Events Survey
B. Complete Stress-Prone Personality Survey
C. Evaluate stress level and performance on Yerkes-Dodson Curve
D. Keep neat handwritten or typed notes on material
DEFINING STRESS

An EMT-P enters a home of a patient and finds a man pointing a gun at him.

An EMT-P delivers a healthy baby on his first shift.

An EMT-P fails her recertification examination.

An EMT-P passes her recertification examination and receives a large bonus from her employer.

All of these situations have one thing in common; stress to the body. Dr. Hans Selye defines stress as "the body's response to any demand placed upon it". The physical reaction of the body to stress is basically the same regardless of the stressor. It appears that all of us have different stress threshold, and we can learn to control this threshold. Stress comes from two basic forces—the stress of physical activity and the stress of mental/emotional activity. It is interesting to see that stress from emotional frustration is more likely to produce disease such as ulcers; stress from physical work or exercise can relax you and help you deal with mental stress.

If you run up a flight of stairs, play tennis, worry or argue, you placing demands on your body. A blow to the face or a kiss on the cheek can both be equally stressful. One causes distress (bad stress), the other causes eustress.
(good stress), both causes a change from your normal resting equilibrium. Even during sleep, your heart continues to beat, your lungs breathe, your stomach digests last night's meal, and even your brain continues to function in the form of dreams. So it would appear impossible to completely avoid stress.

When confronted by a stress-producing agent, we undergo a three-part reaction called the general adaptation syndrome. This syndrome consists of: 1.) the alarm phase, during which the body is put on the alert and summons its defensive forces to combat the stressor; 2.) the resistance stage, is the phase where the body maintains its fight against the stressor; and 3.) the exhaustion stage, when, unable to resist any longer, the body finally gives in to disease and/or death. These three stages resemble the three stages of normal human life; childhood (excessive responses to any kind of stimulus), adulthood (adaptation to most commonly encountered stressors occurs), and finally senility (characterized by irreversible loss of adaptability; and eventual exhaustion).

EMS personnel are particularly prone to high stress due to the variety of conditions under which they must provide medical care. The 24-Hour shift work which keeps the personnel separated from friends and family will also cause performance inefficiency when combined with other stressors. EMS personnel professionals function daily from one extreme to another as they go through the day from
highly-charged life-and-death situations to the mundane preparation for the next emergency.

IDENTIFYING SIGNS AND SYMPTOMS

Signs and symptoms of stress are many and can manifest themselves over a long period of time or occur at a moment's notice. Some of the most common are;
- fatigue, irritability, or depression
- insomnia, lack of motivation
- inability to concentrate, lack of appetite or overeating
- alcohol abuse, drug abuse, migraine headaches
- grinding of teeth, neck stiffness or pain
- increased use of various medicines, accident proneness.

Test yourself on the Stress-Prone Personality Scale.
How to tell if you are a stress-prone personality.

Rating scale: 4-Always 3-Frequently 2-Sometimes 1-Never

1. Do you try to do as much as possible in the least amount of time?

2. Do you become impatient with delays or interruptions?

3. Do you always have to win at games to enjoy yourself?

4. Do you find yourself speeding up the car to beat the red light?

5. Are you unlikely to ask for or indicate you need help with a problem?

6. Do you constantly seek the respect and admiration of others?

7. Are you overly critical of the way others do their work?

8. Do you have the habit of looking at your watch or clock often?

9. Do you constantly strive to better your position and achievements?

10. Do you spread yourself "too thin" in terms of your time?
11. Do you have the habit of doing more than one thing at a time?

12. Do you frequently get angry or irritable?

13. Do you have little time for hobbies or time by yourself?

14. Do you have a tendency to talk quickly or hasten conversation?

15. Do you consider yourself hard driving?

16. Do your friends or relatives consider you hard driving?

17. Do you have a tendency to get involved in multiple projects?

18. Do you have a lot of deadlines in your work?

19. Do you feel vaguely guilty if you relax and do nothing during leisure?

20. Do you take on too many responsibilities?

____ Total

Answer key:

If your score is between 20 and 30, chances are you are non-productive because your life lacks stimulation.

A score between 30 and 50 designates a good balance in your
ability to handle and control stress.
If you tallied up a score ranging between 51 and 60 your stress level is marginal and you are bordering on being excessively tense.
If your total number of points exceeds 60 you may be a candidate for heart disease.

From the book Life Stress by Rosalind Forbes, Copyright 1979 by Rosalind Forbes.
Published by Doubleday & Company, Inc.
<table>
<thead>
<tr>
<th>VALUE</th>
<th>LIFE EVENT</th>
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</thead>
<tbody>
<tr>
<td>100</td>
<td>death of a spouse</td>
</tr>
<tr>
<td>73</td>
<td>divorce</td>
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<tr>
<td>65</td>
<td>marital separation</td>
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<tr>
<td>63</td>
<td>jail term</td>
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<td>63</td>
<td>death of close family member</td>
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<tr>
<td>53</td>
<td>personal injury or illness</td>
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<tr>
<td>50</td>
<td>marriage</td>
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<td>marital reconciliation</td>
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<tr>
<td>45</td>
<td>retirement</td>
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<td>change in health of family member</td>
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<tr>
<td>40</td>
<td>pregnancy</td>
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<tr>
<td>39</td>
<td>sexual difficulties</td>
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<tr>
<td>39</td>
<td>gain of a new family member</td>
</tr>
<tr>
<td>39</td>
<td>business readjustment</td>
</tr>
<tr>
<td>38</td>
<td>change in financial state</td>
</tr>
<tr>
<td>37</td>
<td>death of a close friend</td>
</tr>
<tr>
<td>36</td>
<td>change to a different line of work</td>
</tr>
<tr>
<td>35</td>
<td>change in the number of arguments with spouse</td>
</tr>
<tr>
<td>31</td>
<td>mortgage over $10,000</td>
</tr>
<tr>
<td>30</td>
<td>foreclosure of mortgage loan</td>
</tr>
<tr>
<td>29</td>
<td>change in responsibilities at work</td>
</tr>
</tbody>
</table>
son or daughter leaving home
trouble with in-laws
outstanding personal achievement
wife begins or stops work
begin or end school
change in living conditions
revision of personal habits
trouble with boss
change in work hours/conditions
change in residence
change in schools
change in recreation
change in church activities
change in social activities
mortgage less than $10,000
change in sleep habits
change in number of family get-togethers
change in eating habits
vacation
christmas
minor violations of law

Think about all of the events in your professional and personal life that are causing stress. Combine those events that affect you and total your score. If your score is greater than 300, you are likely to be past the point of
peak performance on the YERKES-DODSON CURVE. LIFE-EVENTS SURVEY developed by Thomas Holmes.
YERKES-DODSON CURVE

Compare your score on the LIFE-EVENTS SURVEY with this curve shown below. Plot your performance and stress level.

PERFORMANCE:

\[ \begin{array}{c}
\text{A} \quad \ast \ast \ast \ast \\
\text{B} \\
\text{C} \\
\end{array} \]

STRESS LEVEL

HOW STRESS AFFECTS THE CARDIOVASCULAR SYSTEM:

STRESSOR

CEREBRUM

HYPOTHALAMUS

SYMPATHETIC NERVOUS SYSTEM (INITIATED)

ELEVATED BLOOD PRESSURE

ATHEROSCLEROSIS

HEART ATTACK

DEATH

NOTE: Meditation can inhibit the Sympathetic Nervous System.
CAUSES OF STRESS

Every aspect of EMS is a source of above-average stress; handling crisis, dealing with confusion, making life or death decision rapidly, driving fast, and shift work are but a few of the stressors. EMS personnel thrive on stress. The stress, however, must be controlled in order to work most effectively. EMS personnel must often witness things which are beyond the normal experiences of most people. The impact of seeing a person crushed or a child burned to death is, of course, stressful. There are other forms of stress besides seeing tragedy. Things such as having a patient vomit on you, bleed on you, bite or spit on you is often difficult to deal with without feeling stress. Often the more subtle aspects are even more stressful for the EMT-P. Things such as; telling an elderly man that his wife is dead, finding out that the drunk driver that ran a red light and killed 4 people is the only non-injured patient, wanting to help and being told to "get out!", finding abused or neglected children, are often the real cause for stress leading to burnout.

Idealism is often significantly high in EMS personnel. The age range which is most often seen among EMS personnel is late teens to mid-twenties. This is particularly an idealistic age. The idealistic person may have been expecting the dramatic call load they saw on television, or maybe thought lives could be saved more often than they
really are. Some accept the reality of the routine things that occur and others burn out.

Shift work is an occupational hazard for EMS personnel. It will never be eliminated. However, many people will never adjust to the abnormal and irregular schedules. Quite often the disorientation and discomfort of rest disturbance affects some people more than others. Issues over pay, administrative differences, lack of appreciation are other causes for stress among EMS personnel.

Thomas Holmes developed a life-events survey to help assess the amount of stress people would experience through routine life events. Check off the events that affect you and your total score. If your score is greater than 300, you are likely to be past the point of peak performance on the Yerkes-Dodson curve. This would indicate a down-slope of performance or burnout.
People who discover the signs and symptoms of stress or burnout within themselves should strive to correct or eliminate the problem areas. However, the first step is to recognize the problem. Often people within the EMS field will see changes in behavior in their co-workers. The individual himself/herself may not be able to see the problem of stress or burnout developing. If the relationship between the two people is an open one, then a non-judgmental, helpful approach may help the person see that he/she has a problem. Concerned friendship with positive suggestions can work wonders! It is very gratifying to see a stressed, burned out individual become productive and energetic. The change in one person can be an incredible moral booster for everyone.

There are some positive approaches to preventing hyperstress and burnout. There are short term measures that are not productive also, such as, drug abuse, alcohol abuse, excuses for behavior, detachment, threats of quitting, these are not the best measures because they are merely palliative.

When an individual realizes he/she is overstressed, it is important to first reevaluate what is occurring his/her life. Coping methods are different for everyone. Finding the right method helps deal with stress because it will cause the individual to stop, reflect on what has been
occuring in his/her life. Ideally, one would develop a long term plan for dealing with the daily stressors of life so as to prevent the sense of overwhelming emotions such as anger, depression, anxiety, from masking themselves into destructive outcomes.

We will discuss several options to take in order to help minimize stress. Those are: exercise, developing outside interests, vacations or work breaks, and meditation.

EXERCISE—Exercise is important for more reasons than just to prevent fatty-cholesterol deposits in the arteries and complications of heart attacks or strokes. It has a direct relationship to the functions of the brain. Studies have shown exercise can relieve the symptoms of depression. In one such study, 6 out of 8 depressed patients were free of depression symptoms after three weeks of an exercise program and they remained free of symptoms as long as the exercise program continued. (L.E. Lamb, 1986)

DEVELOPING OUTSIDE INTERESTS—EMS personalities by nature are very assertive physically active, energetic people. They seem to thrive on activity. Consequently, after a hectic twenty four hour shift it is difficult to gear down to a slower pace. Developing hobbies, participating in sports, or learning about a completely new subject will decrease burnout symptoms.
VACATIONS OR WORKBREAKS— Learn to manage your time well and make time for vacations and work breaks. This is essential to EMS personnel. The need to recharge or reenergize is important to the emotionally healthy individual. Getting away from the job, spending more time with friends (non-EMS friends), and family can be a true life-saving technique!

MEDITATION— Learn to relax! Become aware of the things that cause behavior changes within you. Meditation is an excellent stress management technique. The following are a few basic tips to relaxation:

1. Get 7 to 8 hours of sleep.

2. Arrange a quiet time at least 3 times per day. Allow at least 10 to 15 minutes to relax.

3. If it is impossible to find a quiet place then, just try to concentrate on the relaxation and shut out the distractions.
LESSON PLAN: IV. TECHNIQUES IN PHYSICAL FITNESS

SESSION 5. WARM-UP AND SAFETY TECHNIQUES

TIME: 1.0 HOURS

KEY POINTS:

A. Warm-up Exercises
B. Exercise Safety Tips
C. Conditioning Back/Spine
D. Body Mechanics in Patient Lifting

Student Activities:

A. Demonstrate Warm-up Exercises
B. Demonstrate Exercise Safety Tips
C. Demonstrate Back Exercises
D. Demonstrate Proper Lifting Techniques
Proper stretching will prevent muscle tears from tendinous attachments, and enable the student to exercise vigorously without fear of injury. Expect the following to occur after a proper warm-up period:

1. Viscosity within the muscle is decreased; this allows the muscle to contract and relax with greater speed.
2. Blood flow is increased to the muscles due to blood vessel dilation.
3. Oxygen delivery is increased, due to increase in blood circulation.
4. Heart rate, blood pressure, respiratory rate are also increased.
5. Increase in body temperature.

Begin stretching slowly, paying careful attention to the proper technique used in the following exercises:

1. Middle Squat; Feet are shoulder-width apart, hands on hips, heels on the ground, toes angled out. Sit down as far as you can while keeping back vertical and the hips in line with the shoulders for a 10-second count. Repeat x3.

2. Hamstring Stretch; While standing erect, cross one foot
over the other with the heel of the crossed heel up. This keeps the pelvis straight. Slowly reach and relax upper body down toward the ground to touch the finger tips or palm of the hand. Do this slowly 10 times, then cross the other leg and repeat 10 times. DO NOT BOUNCE!

3. Quadricep Stretch; Kneel to ground with toes pointed away from the body in back of you. Place hands on your arches (feet) in back of you and lean backward, at the same time raising the pelvis up and out. Hold for a 10-second count and repeat x3. Sit on ankles to recover.

4. Groin Stretcher; Start by sitting on floor, back straight, pull heels together into groin area push knees to ground with elbows or hands. Hold for a 10 count and repeat x3.

5. Lower Back Stretcher; Stand with feet shoulder with apart. Slowly lower shoulders and back, bending at waist, to a hanging position. Keep a slight bend in the knees. Relax and hang, turn slowly right then left, 1-2 times. Slowly lift to a standing position.

BREATHING EXERCISE: It is important that proper breathing procedures are learned and done correctly during the exercise program. One should breathe as part of each repetition and not hold breath for 2 or 3 repetitions.
Exhale forcefully through the mouth. Proper breathing assists with the following;

1. Helps enlarge chest, rib cage, and lung capacity.
2. Develops rhythm for the proper execution of the exercise.
3. Helps maintain proper carbon dioxide-oxygen balance.
Exercise safety is essential in any fitness program.

First, the body should be warmed up gradually by stretching and light exercise before any strenuous exercises are begun. The warm-up phase is a protection against injuries and the sudden development of an oxygen deficiency. The length of time varies with each person and the type of exercise to be performed. However, a good standard to follow is 10 minutes. Gradual acceleration of the activity and then slowly decelerate activity with the maximum effort being midway between the beginning and the end of the exercise activity.

The body improves with exercise, however, for best results, exercise must be the right type and in the right amount. The type and amount of exercise should be adapted to the individual's tolerance level. This is the level at which the body responds favorably to exercise. If the workout is too easy it will fall short of the tolerance level and result in little or no improvement. If too demanding, it will exceed the tolerance level and possibly cause injury.

Ease into the exercise program. A high level of fitness cannot be attained overnight, but only after
of regular exercise. Start at a level that does not leave you with undue breathlessness and fatigue, inability to sleep, and elevated resting pulse and prolonged soreness or joint discomfort.

Progression improves the normal exercise load of the body. The body responds to the demands placed upon it. The more the body can adapt to the demands of exercise, the better its capacity to respond to sudden stress. In the early stages, stress improvement in muscle tone and flexibility of the joints. Slow, continued endurance work such as jogging, walking, low-impact aerobics are recommended. As fitness improves the exercises and activities can become more strenuous.

Work all parts of the body and follow a program that will condition and develop the entire body. Work all major muscle groups and do a lot of stretching, bending, and twisting in order to make the joints more flexible. Endurance work will help circulation and respiration.

Practice deep breathing during warm-up, while exercising, and while recuperating. Time the breathing with each exercise so as to get as full and as deep ventilation as possible. Breathing aids the circulation and helps minimize fatigue. Avoid holding breath.
Recuperation is just as important after the exercise as warm-ups are before. After the activity, practice deep breathing and stretch all muscles that have been worked. Keep moving, do not sit down. Cool down gradually until perspiring had ceased.

The length of duration of an exercise session is of prime importance as fitness is to be improved. The standard is currently 20 minutes of vigorous exercise with a 5 minute warm-up and a 5 minute cool-down at least 3 times per week.

After a workout, bathe or shower first with warm water for a short period of time and then change to cool water for a much longer period. Cool water aids the circulation and metabolism and is more recuperative than warm water.

Rest and relaxation is very important for anyone engaged in vigorous exercise. Total fitness includes the ability to relax at will. Relaxation occurs when tension ceases, or is reduced.

If an injury occurs, stop the activity immediately and assess the seriousness. If pain is present, and does not decrease after a short period of time, a serious injury might exist. Look directly at the injury and inspect it for swelling, bruising, or deformity. Palpate it
check the pulse closest to the injury for circulation. Assess the ability to move the injured part. If pain, swelling, bruising, and inability to move the injured part exists, apply an ice pack to the site and seek medical care immediately. Ice packs should be applied for 15-20 minutes at a time, 3-4 times per day.

Proper clothing and supportive shoes are two important considerations of an exercise program, as are the above items. Safety awareness is essential for all health care providers, whether, it is the provider's own safety of the patient's.
Background Data: Conditioning Back/Spine

Back pain is the most common cause of disability and of time from work in the United States. Riding in a car versus walking have contributed greatly to the loss of strong back muscles. As a nation, we are overweight; the extra weight also contributes to the condition of our backs. Rest, exercise, proper lifting techniques, and proper twisting and turning will help the paramedic prevent back pain and injuries.

The following types of back pain demand medical evaluation;
1. Severe pain, which is not relieved with rest and mild pain medication.
2. Lower back pain associated with fever.
3. Lower back pain associated with difficulty in urinating or inability to urinate.
4. Back pain associated with weakness in the foot or leg.
5. Back pain associated with pain, or burning sensation in leg.

The following back exercises are utilized to strengthen the back muscles;
1. Pelvic Tilt
   Lie on back with knees bent.
   Flatten the small of your back to the floor by tightening the abdominal muscles and squeezing the
BUTTOCKS TOGETHER.

HOLD THE POSITION FOR A COUNT OF 5 BUT DO NOT HOLD YOUR BREATH.

2. ONE KNEE TO CHEST

LIE ON BACK WITH KNEES BENT.

GRASP ONE KNEE WITH BOTH HANDS AND PULL IT GENTLY AND TOWARD THE CHEST.

HOLD FOR A COUNT OF FIVE.

RELEASE PULL BUT KEEP GRASP AROUND KNEE.

COMPLETE REQUIRED NUMBER OF REPETITIONS AND THEN LOWER LEG TO START POSITION.

3. BOTH KNEES TO CHEST

LIE ON BACK WITH KNEES BENT.

BRING ONE KNEE TOWARD YOUR CHEST. HOLD IT WITH YOUR HANDS, THEN BRING THE OTHER KNEE TOWARD YOUR CHEST.

HOLD FOR COUNT OF FIVE.

RELEASE PULL, BUT KEEP YOUR GRASP AROUND KNEES.

COMPLETE REQUIRED REPETITIONS, THEN RETURN FEET TO FLOOR ONE AT A TIME KEEPING THE KNEES BENT.

4. CAT BACK

GET DOWN ON YOUR HANDS AND KNEES.

PULL STOMACH IN AND CURVE BACK UPWARD, LET HEAD HANG DOWN. BRING KNEE FORWARD TO OPPOSITE SHOULDER.

HOLD FOR A COUNT OF FIVE, RETURN TO START POSITION.
REPEAT EXERCISES WITH THE OTHER LEG.

5. FLEXOR STRETCHING

GET DOWN ON HANDS AND KNEES.

BRING ONE KNEE TOWARD CHEST AND PLACE FOOT FLAT ON THE FLOOR.

STRAIGHTEN OPPOSITE LEG BEHIND YOU, PUTTING WEIGHT ON BALL OF THE FOOT.

LOWER BENT KNEE AND BODY TOWARD FLOOR KEEPING OTHER LEG STRAIGHT.

RETURN TO STARTING POSITION.

6. CURL UPS

LIE ON BACK WITH KNEES BENT.

POINT HANDS AT KNEES AND FLATTEN BACK AS IN PELVIC TILT.

TUCK CHIN TOWARD CHEST AND SLOWLY CURL UP RAISING HEAD AND SHOULDERS FROM FLOOR.

UNCURL TO ORIGINAL POSITION

These exercises will be utilized throughout the training program in an effort to strengthen the back muscles. Paramedics must do a tremendous amount of lifting throughout a 24 hour period. A strong, stable back is essential to the safety of the paramedic as well as the patient.
BACKGROUND DATA: BODY MECHANICS IN PATIENT LIFTING

Heavy lifting, or variable lifting in EMS is a duty which all paramedics are expected to carry out during a 24 hour shift. Usually, the weight is shared by the two people who work in the ambulance, although some services, especially volunteers, often have more available hands.

Proper lifting techniques are as important as learning to splint, start an intravenous infusion, or do CPR. Not knowing proper techniques of lifting or failing to perform them during patient care is a source of many on-the-job injuries. People do not understand the principles underlying the physics of leverage. They depend on raw strength, instead of proper muscle and skeletal use. People do not ask for help in lifting when the patient is simply too heavy or the patient's position precludes the application of good leverage. People do not heed the signals of their own bodies. Often if one is exhausted, ill, or hypoglycemic from lack of food due to too many calls, one can not do the same amount of work as on other days.

The following are important rules to remember when lifting patients;

1. WHENEVER YOU ARE LIFTING A PATIENT, BE SURE THAT THE PATIENT KNOWS HE IS GOING TO BE LIFTED, HOW YOU PLAN TO DO
IT, AND TO WHERE YOU ARE GOING TO LIFT HIM.

2. SIZE UP THE LOAD TO BE LIFTED. DO NOT ATTEMPT TO LIFT ALONE IF YOU HAVE ANY DOUBT ABOUT YOUR ABILITY TO DO SO.

3. CHECK YOUR FOOTING. YOUR FEET SHOULD BE APART TO GIVE YOU A BROAD BASE OF SUPPORT. (GOOD BALANCE).

4. GET CLOSE TO WHATEVER IS BEING LIFTED, INSTEAD OF REACHING FOR IT. MOVE IN AND HOLD CLOSE TO YOUR BODY.

5. ALIGN YOURSELF TO THE PATIENT OF OBJECT YOU ARE GOING TO LIFT, KEEP YOUR BACK STRAIGHT, BEND AT THE KNEES AND HIPS.

6. STRAIGHTEN YOUR LEGS AS YOU LIFT.

7. LIFT SMOOTHLY TO AVOID STRAIN PRODUCED BY JERKY MOVEMENTS, COUNT TO 3 AND STATE "GO", OR "LIFT", SO BOTH YOU AND YOUR PARTNER LIFT SIMULTANEOUSLY.

8. SHIFT THE POSITION OF YOUR FEET TO TURN, NEVER TWIST YOUR BODY.

9. PUSH OR PULL AN OBJECT (INSTEAD OF LIFTING) WHENEVER YOU CAN.

10. COMMUNICATE WITH YOUR PARTNER, PARTICULARLY IF IT IS A NEW PERSON, ABOUT HOW YOU LIFT. THIS WILL INSURE THAT YOU ARE ALL IN AGREEMENT WITH YOUR "LIFTING" PLAN.
PHYSICAL TRAINING FOR EMT-PS

LESSON PLAN: V. PRINCIPALS OF PHYSICAL EXERCISE

SESSIONS: 1-24 (3 days/week x 8 weeks=24)

TIME: 1.0 Hours/session

KEY POINTS:

A. Assessment of Agility
B. Assessment of Balance
C. Assessment of Cardiovascular System
D. Assessment of Flexibility
E. Assessment of Strength
F. Defensive Techniques

STUDENT ACTIVITES:

A. Demonstrate AGILITY to standards established
B. Demonstrate BALANCE to standards established.
C. Demonstrate CARDIOVASCULAR CONDITIONING to
standards established.

D. Demonstrate FLEXIBILITY to standards established.

E. Demonstrate STRENGTH to standards established.

F. Demonstrate DEFENSIVE TECHNIQUES.
BACKGROUND DATA: ASSESSMENT OF AGILITY

Agility is the ability to react quickly with controlled body movements. It requires agility to run down a steep hill, dodge falling or thrown objects, jump over fences or barriers, or climb a ladder quickly. Agility enables a person to successfully cope with many EMS calls that an EMT-P will respond to and minimize the chance of injury to one's self.

Assessment of AGILITY will be done through demonstrations and return demonstrations the following exercise:

SQUAT THRUSTS:

FROM A STANDING POSITION, DROP DOWN TO A SQUATTING POSITION, WITH PALMS FLAT AGAINST THE FLOOR, AND ARMS/ELBOWS STRAIGHT. NEXT, WITH WEIGHT SUPPORTED ON THE HANDS, KICK BACKWARD SO THAT YOUR LEGS ARE EXTENDED FULLY. IMMEDIATELY KICK FORWARD TO THE SQUATTING POSITION, AND STAND UP. GOAL: PERFORM 4 SQUAT THRUSTS IN 8 SECONDS.

BACKGROUND DATA: ASSESSMENT OF BALANCE

The ability to balance is the result of neuromuscular control. The muscles and nerves work together during the performance of various movements and skills. Good balance is an important factor in all physical skills because it
enables one to use his full physical potential. Poor balance reduces this potential and often causes one to be "accident prone" due to poor body control. Assessment of BALANCE will be done through demonstrations and return demonstrations of the following exercise.

BALANCE TEST:

STAND ON TOES, WITH HEELS TOGETHER, EYES CLOSED, AND ARMS STRETCHED FORWARD AT SHOULDER LEVEL. MAINTAIN THIS POSITION FOR A FULL 20 SECONDS WITHOUT SHIFTING FEET OR OPENING EYES. GOAL: MAINTAIN POSITION FOR 20 SECONDS.

BACKGROUND DATA: ASSESSMENT OF CARDIOVASCULAR SYSTEM

Endurance is another term used when discussing the cardiovascular system/status. Endurance is the capacity for continued exertion over a prolonged period of time. It is dependent upon a good circulatory system which can speed up its job of supplying oxygen to the working muscles. Just as agility and balance are important when lifting or carrying a patient on a backboard or gurney, ENDURANCE is equally important, especially if the rescue is considered to be a Heavy Rescue and the carrying distance is long and/or over difficult terrain. Endurance is now regarded as the prime factor in determining fitness. Fitness has two major components; cardiovascular, which pertains to
heart and blood vessels, and musculoskeletal, which pertains to the skeletal and musculature.

Another common term used in discussing ENDURANCE or CARDIOVASCULAR FITNESS is AEROBIC CAPACITY. Aerobic capacity depends upon the total work accomplished, or the body’s ability to transport and utilize oxygen. The following points are important to remember:

1. CARDIOVASCULAR/ENDURANCE/AEROBIC CAPACITY WILL BE STRESSED AT EACH EXERCISE SESSION AS FOLLOWS;
   FREQUENCY- 3 DAYS PER WEEK
   DURATION- 8 WEEKS/ 1 HOUR PER SESSION
   MODE OF ACTIVITY-CURETON’S BREATH-HOLDING TEST
   COOPER’S 12-MINUTE WALK/RUN TEST
   AEROBICS-40 MINUTES, NON-STOP
   POWER WALKING, 2-4 MILES IN 20-30 MIN.
   RUNNING, 2 MILES IN 16 MIN.
   ROPE SKIPPING, 20-30 MIN. NON-STOP

2. ASSESSMENT OF PULSE RATES WILL BE ESSENTIAL. THE FOLLOWING WILL BE THE REQUIRED PROCEDURE;
   A. TAKE A 6 SECOND OR 15 SECOND PULSE COUNT AS FOLLOWS;
      BEGIN THE COUNT WITH ZERO AS THE SECOND-HAND CROSSES OVER ANY 5 SECOND MARK, THEN COUNT THE NUMBER OF BEATS IN 6 SECONDS AND ADD "0"; THIS WILL GIVE YOU BEATS PER MINUTE.
      BEGIN A 15 SECOND COUNT, THEN MULTIPLY BY 4 TO GET THE PULSE RATE FOR ONE MINUTE.
      USE THE CAROTID ARTERY FOR PULSE CHECK. USE CORRECT FINGER POSITION.
B. FIGURE THE TRAINING HEART RATE AS FOLLOWS;

220-AGE-RESTING HEART RATE X 80% + RESTING HEART RATE
RECOVERY HEART RATE (HEART RATE 5 MINUTES AFTER THE
COMPLETION OF EXERCISE) SHOULD BE LESS THEN 120 BEATS PER
MINUTE. TEN MINUTES AFTER COMPLETION OF EXERCISE,
RESPIRATION RATE SHOULD BE 12-16 PER MINUTE. HEART AND
RESPIRATION RATES OF ABOVE THIS MEANS THE PARTICIPANT IS
OVEREXTENDING HIMSELF/HERSELF.

The following are descriptions of the required
cardiovascular activities required of the participants.
1. CURETON’S BREATH-HOLDING TEST; Using a chair or stool
which is 17 inches high, the participant will step onto and
off for a period on one minute, then an assessment of
his/her ability to hold breath for 30 seconds will be done.
2. COOPER’S 12 MINUTE WALK/RUN TEST; A pre-selected, 2
mile distance will be used to assess the participant in
his/her ability to walk/run the distance in 12 minutes.
The following standard will be utilized;

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<tr>
<td>I. very poor</td>
<td>1.0</td>
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<tr>
<td>II. poor</td>
<td>1.0-1.24</td>
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<tr>
<td>III. fair</td>
<td>1.25-1.49</td>
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<tr>
<td>IV. good</td>
<td>1.50-1.74</td>
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<tr>
<td>V. excellent</td>
<td>1.75+</td>
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3. AEROBICS; The participants will do a standard 40 minute, non-stop, aerobic exercise activity to music. The activity will begin with slow, gradual exercises which will increase in intensity at the half-way point, then slow down in pace. All parts of the muscular and skeletal system will be exercised during the session.

4. POWER-WALKING, will utilize the muscular and skeletal systems as well, but specifically use of the arms will be demonstrated. The distance to be covered will be 2 to 4 miles in 20 to 30 minutes.

5. RUNNING, will utilize a pre-selected distance covering 2 miles and will be accomplished over a 16 minute period.

6. ROPE SKIPPING will be done over a 20-30 minute period at full intensity, non-stop.

BACKGROUND DATA: ASSESSMENT OF FLEXIBILITY

Flexibility pertains to a person's ability to move his joints. A person with flexible joints has a wide range of movement while one who is stiff has a very restricted range of movement. Flexibility will be assessed with the following exercises;

TRUNK FLEXION

KEEP LEGS TOGETHER, WITH KNEES LOCKED, BEND AT WAIST AND TOUCH THE FLOOR WITH PALMS OF HANDS.
TRUNK EXTENSION

LIE FLAT ON ABDOMEN, FACE DOWN, FINGERS LACED BEHIND NECK AND FEET ANCHORED TO FLOOR. RAISE CHIN UNTIL IT IS 18 INCHES OFF THE FLOOR.

SIT AND REACH FLEXIBILITY TEST

SIT ON FLOOR, WITH LEGS TOGETHER, FEET MUST BE FIRMLY AGAINST WALL/BOARD, BEND AT WAIST AND REACH PAST TOES. USE SCALE BELOW TO ASSESS FLEXIBILITY.

EXCELLENT = 7 INCHES +
GOOD = 4-6 3/4 INCHES +
AVERAGE = 0-3 3/4 INCHES +

BACKGROUND DATA: ASSESSMENT OF STRENGTH

Strength refers to a person’s ability to exert force with the hands, arms, legs, or trunk. A certain amount of strength is needed to perform routine EMT-P duties, such as lifting, carrying, or pulling. Strong legs are necessary for running, walking, or jumping. Lack of strength prohibits the performance of many tasks which could seriously impede patient care or the EMT-P’S safety. The following will be used to assess strength.
### SIT-UPS

(Number in 60 seconds)

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<th></th>
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<tbody>
<tr>
<td>Age</td>
<td>17-19</td>
<td>20-29</td>
<td>30-39</td>
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</tr>
<tr>
<td>Exc.</td>
<td>54</td>
<td>51</td>
<td>44</td>
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<tr>
<td>Good</td>
<td>44-53</td>
<td>40-50</td>
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<tr>
<td>Min.</td>
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<td>20-29</td>
<td>30-39</td>
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<tr>
<td>Exc.</td>
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<td>31-40</td>
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### PUSH-UPS

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<tr>
<td>Exc.</td>
<td>51</td>
<td>43</td>
<td>37</td>
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</tr>
<tr>
<td>Good</td>
<td>35-50</td>
<td>30-42</td>
<td>25-36</td>
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<tr>
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<td>19-34</td>
<td>17-29</td>
<td>13-24</td>
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<tr>
<td>Min.</td>
<td>11-20</td>
<td>12-22</td>
<td>10-21</td>
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BACKGROUND DATA: DEFENSIVE TECHNIQUES

It may seem strange that an EMT-P would have to take measures to guard himself/herself against the very people they want to help, however, the very nature of the EMS profession warrants precautions and the need for learning defensive techniques. Keeping in good physical condition will be the most advantageous step in defensive techniques. An EMT-P may have only himself/herself to count on during a critically dangerous situation. The following are defensive measures that should not be forgotten;

1. When in doubt about the safety of a situation, always call law enforcement personnel for back-up BEFORE entering or approaching the scene.

2. Do not be caught off guard- be aware of street weapons such as knives, sharp instruments used as weapons, guns, or any other item with a weapon potential.

3. Know your population! This will tell you if you should be especially aware of the danger of weapons or weapon potential items available.

4. Develop your street awareness or sixth sense. This will help you decide if you need assistance or are in imminent danger.

5. Make certain you possess good techniques in restraining patients, using soft or leather restraints, and using the gurney straps to secure your patient.
6. Do not turn your back on a dangerous patient, walk backward carefully.

7. Work on your communication skills, often this alone is all the defense you need in calming a patient, family, or by-standers.
PHYSICAL FITNESS TRAINING FOR PARAMEDIC STUDENTS

FINAL WRITTEN EXAMINATION/SAMPLE QUESTIONS TO BE UTILIZED IN CONJUNCTION WITH THE SKILLS PERFORMANCE EXAMINATION

1. BALANCE IS:
   A. Stamina dependent upon strength.
   B. Muscles and nerves working together during the performance of various movements and skills.
   C. A good circulatory activity.
   D. Continued exertion over a prolonged period of time.

2. CARDIOVASCULAR FITNESS IS ASSESSED BY THE:
   A. Cureton's Breath-Holding Test.
   B. Cooper's 12 Minute Walk/Run Test
   C. Aerobics 40 Minutes Non-Stop
   D. All of the above

3. ENDURANCE IS:
   A. The lifting or pulling of heavy objects.
   B. The capacity for continued exertion over a prolonged period of time.
   C. The ability to move joints in different directions.
   D. The performance of various activities for the purpose of increasing agility.
4. FLEXIBILITY IS:
   A. The ability to react quickly with controlled body movements.
   B. The required strength, power or endurance necessary in EMS.
   C. The power to propel an object.
   D. The assessment of the Cureton Test.

5. TO DETERMINE THE SERIOUSNESS OF AN EXERCISE INJURY:
   A. Examine the injured area.
   B. Assess the level of pain.
   C. Observe for swelling or bruising.
   D. All of the above.

6. USE OF AN ICE PACK ON AN INJURY IS LIMITED TO A PERIOD OF 15-20 MINUTES.
   A. TRUE
   B. FALSE

7. PROPER LIFTING TECHNIQUES DEPEND ON RAW STRENGTH.
   A. TRUE
   B. FALSE

8. IMPROPER LIFTING TECHNIQUES UTILIZES THE MUSCLES AND SKELETAL SYSTEMS.
   A. TRUE
   B. FALSE
9. UNREALISTIC EXPECTATIONS ARE A SOURCE OF STRESS IN EMS PERSONNEL.
   A. TRUE
   B. FALSE

10. EMS SHIFT WORK, WHICH IS A 24-HOUR PERIOD, REDUCES THE STRESS LEVEL IN EMS PERSONNEL.

MATCH COLUMN (I) TO COLUMN (II). PLACE THE CORRECT ANSWER IN THE BLANK TO THE LEFT OF COLUMN (I).

<table>
<thead>
<tr>
<th>COLUMN (I)</th>
<th>COLUMN (II)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. MILK GROUP</td>
<td>A. EGGS</td>
</tr>
<tr>
<td>12. MEAT GROUP</td>
<td>B. CEREAL</td>
</tr>
<tr>
<td>13. VEGETABLE-FRUIT GROUP</td>
<td>C. CHOLESTEROL</td>
</tr>
<tr>
<td>14. BREAD GROUP</td>
<td>D. CHEEZE</td>
</tr>
<tr>
<td>15. DIABETES</td>
<td>E. LACTASE</td>
</tr>
<tr>
<td>16. SMOKING</td>
<td>F. CITRUS JUICE</td>
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<tr>
<td>17. CHOLESTEROL</td>
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<tr>
<td>18. HYPERTENSION</td>
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<tr>
<td>19. OBESITY</td>
<td></td>
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</tbody>
</table>
20. BACK PAIN  
21. STRESS  
22. AGILITY  
23. SWELLING  
24. YERKES–DODSON  
25. AEROBIC

PHYSICAL FITNESS TRAINING FOR PARAMEDIC STUDENTS

SKILLS PERFORMANCE EVALUATION CHECKLIST; UPON CONCLUSION OF 8 WEEKS OF PHYSICAL FITNESS TRAINING, THE PARTICIPANT WILL ACHIEVE THE FOLLOWING EXERCISE COMPETENCIES:

<table>
<thead>
<tr>
<th>SKILL</th>
<th>PROCEDURE</th>
<th>PROFICIENT</th>
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<tbody>
<tr>
<td>1. AGILITY</td>
<td>YES NO</td>
<td></td>
</tr>
<tr>
<td>2. BALANCE</td>
<td>YES NO</td>
<td></td>
</tr>
<tr>
<td>3. ENDURANCE</td>
<td>CURETON’S TEST</td>
<td>YES NO</td>
</tr>
<tr>
<td></td>
<td>COOPER’S TEST</td>
<td>YES NO</td>
</tr>
<tr>
<td></td>
<td>AEROBICS</td>
<td>YES NO</td>
</tr>
<tr>
<td></td>
<td>POWER-WALKING</td>
<td>YES NO</td>
</tr>
<tr>
<td></td>
<td>RUNNING</td>
<td>YES NO</td>
</tr>
<tr>
<td></td>
<td>ROPE SKIPPING</td>
<td>YES NO</td>
</tr>
</tbody>
</table>
4. STRENGTH
   PUSH-UPS  YES  NO
   SIT-UPS  YES  NO

5. FLEXIBILITY
   SIT AND REACH TEST  YES  NO

PHYSICAL FITNESS TRAINING FOR PARAMEDIC STUDENTS

COURSE EVALUATION

Rate this course in PHYSICAL FITNESS TRAINING in relation to assisting you in being successful in the EMT-P field:

1 = SUPERIOR  2 = ABOVE AVERAGE  3 = AVERAGE  4 = POOR

1. ORGANIZATION OF COURSE_____

2. STAFF _____

3. MATERIAL DISTRIBUTED _____

4. MATERIAL PRESENTED _____

5. EXERCISE SESSIONS _____

6. TIME ALLOTTED FOR SESSIONS _____
LONG TERM COURSE EVALUATION

FOLLOWING A TWO YEAR PERIOD, A STUDY WILL BE CONDUCTED TO ASSESS STUDENTS SELECTED AT RANDOM WHO PARTICIPATED IN THE INITIAL PILOT COURSE IN PHYSICAL FITNESS TRAINING FOR EMT-PS. THE STUDY WILL REVIEW THE INITIAL DATA OBTAINED ON THE STUDENTS, INTERMITTEN TESTING DONE DURING THE COURSE, FINAL EXAMINATIONS, AND CURRENT RESULTS IN THE FOLLOWING CATEGORIES:

1. HEIGHT
2. WEIGHT
3. BLOOD PRESSURE
4. PULSE
5. SMOKER
6. NON-SMOKER
7. INJURIES/JOB-RELATED
8. AGILITY
9. BALANCE
10. FLEXIBILITY
11. STRENGTH
12. CARDIOVASCULAR
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