

Physical Fitness

For a Life in EMS

“The World is a Vampire”

Sucking the life out
of your career.

Physical Demands of Your Job

- Perform very heavy work requiring lifting and carrying, with a partner, often in excess of 200 lbs.
- Crouch, stoop, bend, kneel, twist, push, pull and reach above and below shoulder level with both arms to assist patients.
- Attend combative, intoxicated and psychologically disturbed patients.
- Be prepared for regular exposure to situations which have the potential to cause critical incident stress.
- Work in an unregulated and uncontrolled environment.

Environmental Discomforts

- Noise
- Vibration
- Odors
- Heat
- Cold
- Weather
- Hazmat
- Confined space
- NBC threats

Types of OTJ Injuries

- Over-exertion injuries
 - Lifting, pushing, carrying and transferring patients.
 - » 35% of incidents, 49% of claims
- Motor vehicle incidents
 - 20% of incidents, 5% of claimss
- Exposures
 - 16% of incidents, 17% of claims
- Slips/Trips/Falls
 - 13% of incidents, 16% of claims

Paramedic Staff Occupational Safety and Health Training Program.
Paramedic Academy Justice Institute of BC

How does your career survive these hazards?

Training and Education
Employer Workplace Safety Initiatives
Physical Fitness

The factor the individual has the most control over and the one most often neglected is. . .

. . . physical fitness.

Law Enforcement



Fire Fighters



EMS

- No routine physical fitness employment testing
- No routine exercise programs
- No mandatory physical fitness requirement
- Most out-of-shape of public safety, but. . .
- Every call you answer requires lifting and moving

Define: Physical Fitness

- The ability to carry out daily tasks with
 - Alertness
 - Undue fatigue
 - Ample energy to enjoy leisure time
 - Ability to respond to stress and crisis
 - Ability to bounce back from illness and injury

Obesity in America

Obesity Trends Among U.S. Adults between 1985 and 2004

- Obesity: having a very high amount of body fat in relation to lean body mass, or Body Mass Index (BMI) of 30 or higher.
- Body Mass Index (BMI): a measure of an adult's weight in relation to his or her height, specifically the adult's weight in kilograms divided by the square of his or her height in meters.

What is Obese

- Body mass index
 - Formula: $\text{weight (lb)} / [\text{height (in)}]^2 \times 703$
 - Example: Weight = 150 lbs, Height = 5'5" (65")
Calculation: $[150 \div (65)^2] \times 703 = 24.96$
- BMI Status
 - Below 18.5 Underweight
 - 18.5 – 24.9 Normal
 - 25.0 – 29.9 Overweight
 - 30.0 and above Obese
 - > 40 Morbidly Obese
 - > 50 Malignant Obesity

Waist Size

- Women
 - Risk 31.5
 - Substantial risk at 35 inches
- Men
 - Risk at 37 inches
 - Substantial risk at 40 inches.
- **The more fat around your abdomen, the more around your heart, liver, etc.**

What's the Big Deal? Aren't all Americans Overweight?

- "Diabetesity"
 - A weight increase of 11-18 doubles the risk of developing type 2 diabetes.
 - Over 80 percent of people with diabetes are overweight or obese.
 - 112,000 American deaths annually contributed to obesity (JAMA)
 - Cancers
 - » Colon, prostate, kidney, liver

What's the Big Deal? Aren't all Americans Overweight?

- Sleep apnea
- Deep vein thrombosis
- Arthritis
- Stroke
- Hypertension

Your image as a
professional!

Obesity Trends in the US

2004 Data

Citations

Source: BRFSS, CDC.

Source: Mokdad A H, et al. JAMA 1999;282:16.

Source: Mokdad A H, et al. JAMA 2001;286:10.

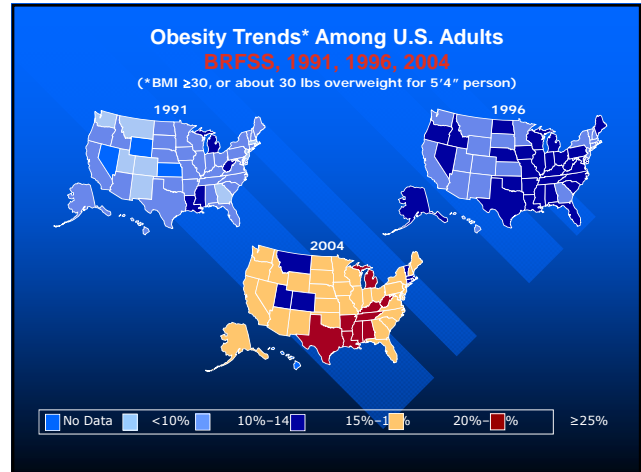
Source: Mokdad A H, et al. JAMA 2003;289:1.

Obesity Trends Among U.S. Adults between 1985 and 2004

Source of the data:

- The data shown in these maps were collected through CDC's Behavioral Risk Factor Surveillance System (BRFSS). Each year, state health departments use standard procedures to collect data through a series of monthly telephone interviews with U.S. adults.
- Prevalence estimates generated for the maps may vary slightly from those generated for the states by BRFSS (<http://aps.nccd.cdc.gov/brfss>) as slightly different analytic methods are used.

- During the past 20 years there has been a dramatic increase in obesity in the United States. In 1985 only a few states were participating in CDC's BRFSS and providing obesity data. In 1991, four states had obesity prevalence rates of 15-19 percent and no states had rates at or above 20 percent.
- In 2004, 7 states had obesity prevalence rates of 15–19 percent; 33 states had rates of 20–24 percent; and 9 states had rates more than 25 percent (no data for one state).



How many calories do I need?

- <http://www.hpathy.com/healthtools/calories-need.asp>
- http://www.cancer.org/docroot/PED/content/PE_D_6_1x_Calorie_Calculator.asp
- http://www.freedieting.com/tools/calorie_calculator.htm

Basal Metabolic Rate

- **Women:**
 $655 + (4.3 \times \text{weight in pounds}) + (4.7 \times \text{height in inches}) - (4.7 \times \text{age in years})$
- **Men:**
 $66 + (6.3 \times \text{weight in pounds}) + (12.9 \times \text{height in inches}) - (6.8 \times \text{age in years})$
- Write down this number

Exercise

- Add BMR
 - Sedentary : BMR x 20 percent
 - Lightly active: BMR x 30 percent
 - Moderately active (You exercise most days a week.): BMR x 40 percent
 - Very active (You exercise intensely on a daily basis or for prolonged periods.): BMR x 50 percent
 - Extra active (You do hard labor or are in athletic training.): BMR x 60 percent
- Add this number to your BMR

How to Control Your Weight

- Consume fewer calories than you burn
- Burn more calories than you consume
- Daily energy expenditure
 - 54 y/o male, 6', 200 lbs (me)
 - 2800 calories per day just to keep going
- Body expenditure
 - It takes about 10% of what you consume to process food through your system

3,500 = 1

10 Disciplines of Effective Nutrition

- The majority of your daily caloric intake should be in whole foods, except workout and post-workout drinks
- Always eat a complete (containing all the essential amino acids), lean protein with each meal.
- Consume either fruits or vegetables with each meal.
- Eliminate starchy carbohydrates from daily consumption, except morning oatmeal.
- The majority of your carbohydrate intake should come from fruits and vegetables, with the exception of workout and post-workout drinks & meals and the morning oatmeal.

10 Disciplines of Effective Nutrition

- Do away with all simple sugars and nutrient barren carbohydrates (e.g. candy, cake, cookies, pastries and the like).
- Make certain that 20-30% of your energy intake comes from fat, with your fat intake split equally between saturates (e.g. animal fat), monounsaturated (e.g., olive oil), and polyunsaturated (e.g. flax oil, salmon oil).
- Drink only non-caloric beverages, the best choices being water and green tea.
- Imbibe no less than 10, eight ounce glasses of water per day. More if you exercise and you should be exercising.
- Consume every 2-3 hours, no matter what. You should eat between 5-8 meals per day.

Nutrition at EMS

- Plan your meals
 - Know tonight what you plan to eat tomorrow on shift.
 - Write it down
 - Count calories if you are on a weight control diet
 - Eat what you plan
 - Bring your food or eat out but stick to the diet
 - Follow the 10 nutrition disciplines when eating at work

Getting to Your Optimal Weight

- Go slow
 - You didn't gain the weight overnight
- Exercise
- Calculate BMR
- Cut 500 calories per day
 - 3,500/week
- Don't watch the scales
 - Use waist size instead
- If you slip?

Exercise

Exercise

- Stretch before and after
- Exercise regularly
- 20 – 30 minutes per day average
- Start out easy, slow and build up
- Cross train
 - » Cardio and muscle
- Working out at work?

Calories Burned in 30 Minutes

- | | |
|---|--|
| - Football - playing catch 114 | - Stair Step Machine 318 |
| - Bowling 138 | - Hockey 366 |
| - Golf – cart 156 | - Situps / crunches – vigorous 366 |
| - Mowing – push 198 | - Rowing machine – vigorous 396 |
| - Basketball - shooting baskets 204 | - Swimming – vigorous 443 |
| - Dancing - fast ballroom 252 | - Rope jumping 456 |
| - Dancing - aerobic, ballet, modern 270 | - Running 6 mph 456 |
| - Lifting weights – vigorous 276 | - Bicycling / cycling 14-16 mph 480 |
| - Aerobics - low impact 276 | - Stationary bicycle / spinning – vigorous 516 |
| - Walking 4 mph 312 | |
| - Jogging 318 | |

Personal PT Program

- Scale your exercise to your ability/needs
- Do something every day you can
 - 3 day on, 1 day rest
- Mix it up – make it fun
- Start out easy
- Functional fitness – make it work for you
- Exercise should not hurt
 - Muscles should be tired but not in pain

My Favorite Exercises

- | | |
|---|--------------------|
| - Stretching | - Shoulder presses |
| - Squats – best single exercise you can do. | - Push press |
| - Walk | - Squat press |
| - Run | - Pullups |
| - Cycling | - Dips |
| - Stair climb | - Rowing |
| - Wallball | - Pushups |
| - 22 lb medicine ball | - Situps |

Cross Train

Note: there are no body building exercises on my list.

My Favorite Workout Web Site

- <http://www.crossfit.com/>

Back Injuries

Prevention Guide for Healthcare Providers

The Spine

- Structure and support
- Move freely and with flexibility
- Protects your spinal cord



Anatomy

- Made up of 24 bones (vertebrae) stacked on top of each other
- Normal spine has an “S” like curve
 - Allows for an even distribution of weight
- Between each vertebra is a soft, gel-like cushion called a disc
 - Disc absorb pressure and keeps bones from rubbing against each other

Anatomy

- The spinal column also has real joints called facet
 - Link vertebrae together and give them flexibility to move against each other
 - There are two facet joints between each pair of vertebrae, one on each side
 - Extend and overlap each other to form a joint between the neighboring vertebrae facet joints

Pathologic Concepts of the Spine

- Mechanical –
 - Called back strain because it is linked with the movement of the spine
 - Occurs when injury to the discs, facet joints, ligaments, or muscles result in inflammation.
 - The more you use your spine, the more it hurts.

Pathologic Concepts of the Spine

- Compressive –
 - Result of pressure or irritation on the spinal cord, or nerves that leave the spine.
 - Example: disc herniates and pushes into the spinal canal
 - This pressure causes pain, numbness, and muscle weakness where the nerve travels

Back Injuries

- 1,000,000 + workers suffer from back injuries
- No single causal factor
- Damage over a long period of time
- Certain actions, motions and movements are more likely to cause and contribute to back injuries than others

Common Causes of Strain Injuries

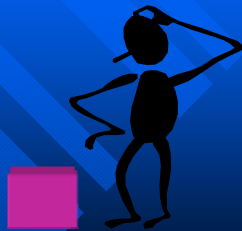
- Heavy lifting
- Twisting
- Reaching and lifting
- Carrying and lifting
- Working in awkward positions
- Sitting or standing too long
- Slips, Trips and Falls
- Bad sleeping positions

The Golden Rules

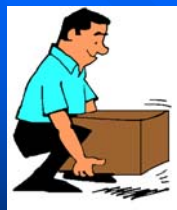
- Planes of movement:
 - Front to Back – neck: 45°, waist 30°
 - Side to Side – neck 45°, waist 30°
 - Rotation – neck 90°, waist 30°
- Rule #1 – avoid combining basic movements
- Rule #2 – avoid taking movements beyond their limits

Proper Lifting

- 1. Warm-up your muscles by stretching
- 2. Plan the lift, ask yourself
 - Is the load an awkward size or shape? Is it too heavy for one person?
 - Do I need help?
 - Do I need a tool to assist me?



Proper Lifting (cont.)



- 3. Get someone to help and/or a tool if you need it
- 4. Bring the load as close to your body as possible
- 5. Use a wide, balanced stance with one foot slightly ahead of the other
- 6. Lift the load slowly using your legs

Proper Lifting (cont.)



- 7. Use smooth movements
- 8. If two people are lifting the load, synchronize the lifting by counting down (3,2,1 lift). Follow the same lifting technique.

Proper Lifting (cont.)

- 9. Set the load down using the leg and back muscles; comfortably lower the load by bending at the knees
- 10. Avoid reaching when setting the load down
- 11. Always lift a balanced, even load
- 12. Use mechanical lifting devices for heavy or awkward loads



Proper Lifting Summary

- Hug the load
- Avoid reaching
- Avoid twisting, pivoting;
 - turn with your feet
- Bend your knees
- Use your legs to lift
- Use smooth movements
- Acknowledge your limitations; get help when you need it!

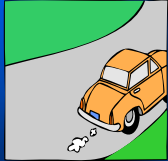


Standing



- Change positions frequently
- Bend your knees to lean forward
- Use a rail or stable object to rest one foot higher than the other
- Take mini-breaks to do alternate tasks; give your back a break

Driving



- Adjust your seat to have your arms a comfortable distance from the wheel and your legs & feet in a relaxed position for using the pedals
- Over reaching your arms or stretching your legs to reach the pedals increases low back curve and strain
- Support your back with lumbar support
- Drive with both hands on the wheel

Sitting

- Use good, comfortable posture
- Adjust the chair height to have your feet comfortably resting on the ground or a foot rest
- Adjust the back of the chair to allow you to work or relax with your back firmly supported
- Move close to your work/task to avoid arching your back
- Take mini-breaks to do alternate tasks in the standing position or by taking a walk

Sleeping

- Sleep on a firm support mattress
- Sleep in a good position
 - on your side with knees bent
 - on your back with your knees slightly elevated
- Get plenty of sleep to be well rested and alert

Prevent Back Injuries

- ☑ Use proper lifting techniques
- ☑ Exercise on a regular basis
- ☑ Place objects up off the floor
- ☑ Use carts, dollies, and other lifting devices whenever possible
- ☑ Test the weight of an object before lifting by picking up a corner
- ☑ Get help if the object is too heavy



