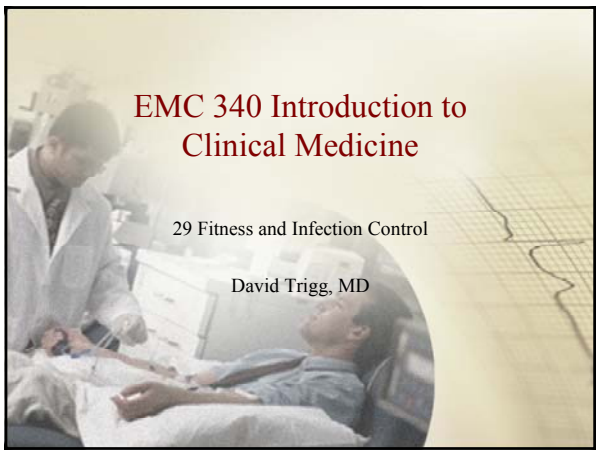

EMC 340 Introduction to Clinical Medicine

29 Fitness and Infection Control

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Outcomes

Upon completion of this lecture the learner should be able to:

- Explain the components and benefits of fitness training including cardiovascular endurance, weight control, muscular strength training, flexibility, and stress reduction
- Explain how the above fitness training components can be achieved.
- Explain the calculation of target heart rate.

Outcomes, continued

- Discuss target heart rate as the best determinant of aerobic conditioning and of resulting cardiovascular endurance.
- Review the basics of proper and improper body mechanics for lifting and moving patients.
- Describe infectious disease prevention.
- Describe body substance isolation steps to take for personal protection from airborne and bloodborne pathogens.

Stress Management in the Future

- Potential strategies
  - Less work
  - More money
- More realistic strategies might include
  - Regular exercise
  - Attention to diet

Managing Stress

Common techniques for managing stress

- Detrimental
- Beneficial
  - Healthy techniques
    - Fitness

Fitness

Fitness Components

- Strength
- Flexibility
- Endurance
- Body composition
- Stress reduction

Expected Benefits

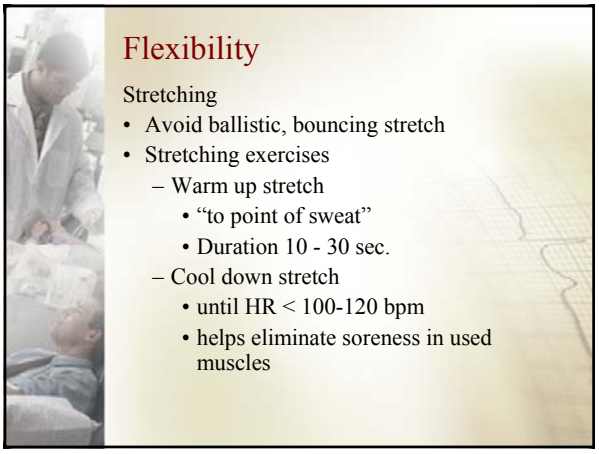
Musculoskeletal
- Strength
- Flexibility

Cardiovascular
- Endurance (duration, frequency, and intensity)
- Stress reduction
- Weight control

Strength Training

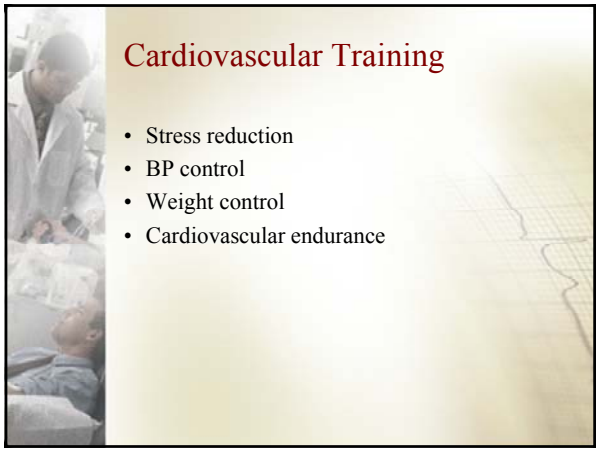
Regular exercise and increasing weight and/or duration.

- Isometric (against stable resistance)
- Isotonic (working through range motion)
- Isokinetic (working against constant tension)



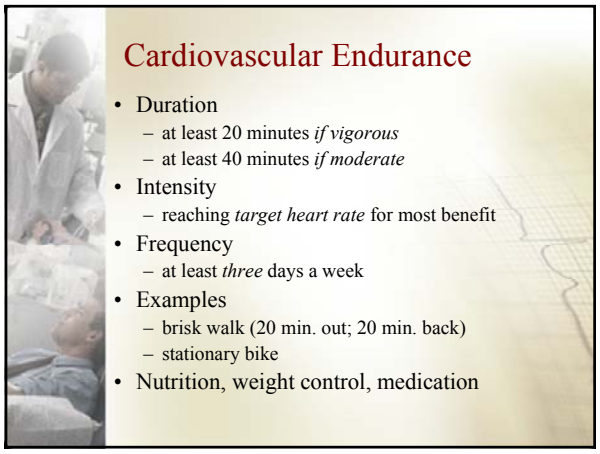
Flexibility

Stretching
- Avoid ballistic, bouncing stretch
- Stretching exercises
  - Warm up stretch
    - "to point of sweat"
    - Duration 10 - 30 sec.
  - Cool down stretch
    - until HR < 100-120 bpm
    - helps eliminate soreness in used muscles



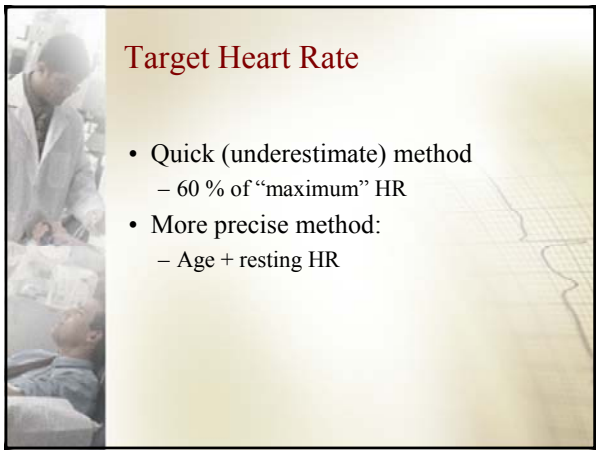
Cardiovascular Training

- Stress reduction
- BP control
- Weight control
- Cardiovascular endurance



Cardiovascular Endurance

- Duration
  - at least 20 minutes *if vigorous*
  - at least 40 minutes *if moderate*
- Intensity
  - reaching *target heart rate* for most benefit
- Frequency
  - at least *three* days a week
- Examples
  - brisk walk (20 min. out; 20 min. back)
  - stationary bike
- Nutrition, weight control, medication



Target Heart Rate

- Quick (underestimate) method
  - 60 % of "maximum" HR
- More precise method:
  - Age + resting HR

Target Heart Rate

More precise method: *both* age and resting HR
example age: 20 years old
resting HR: 80 bpm

- First: maximum HR 220 - age = 200 (max HR)
- Next: subtract the resting HR (80) from max. HR 200-80 = 120 (reserve)
- Then calc. *60% of reserve*:
  - 120 (reserve)
  - x *60%* (desired %) = 72
- then add this 72
  - back to the resting HR (80): 80 + 72 = **152** bpm
  - 152 is the minimum target HR (>> the quick method, which was 120 bpm)

Cardiovascular Endurance

Best aerobic conditioning

- starting stimulus is target HR;
  - in above example: 152 bpm
  - this target of 152 is considerably higher than the quick estimate of 120
- While training: rate of 152 bpm
  roughly ≈ 15 beats / 6 seconds
- Take pulse 6 sec then multiply by 10 to estimate if you are close to your target HR

Protection from Back Injury

- Weight control and nutrition
- Strength training
- Stretching
- Judgment
- Large muscles (***legs***)
- Straight, "locked in" back
- Avoid twisting

Protection from Infectious Disease

- Types of infectious disease
- Infection control practices:
  - body substance isolation

Infection Control Practices

- PPE
- HEPA mask-protection against TB
- Infection control
  - Cleaning – washing
  - Disinfecting - removing most microbes from the surface
  - Sterilizing
    - killing all microbes on an object, or
    - Gloving
      - Non sterile gloves
      - protection for paramedic *only*

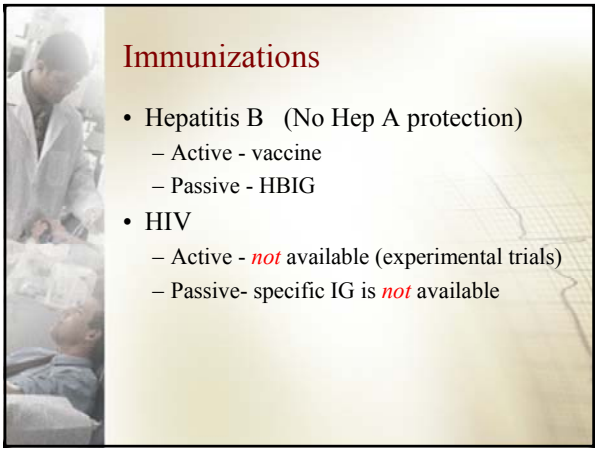
Sterile gloves - protection for patient and paramedic

Post Exposure Procedures

- Exposure
  - needle stick
  - any blood or body fluid
- Contact with
  - mucous membranes
  - broken or non-intact skin

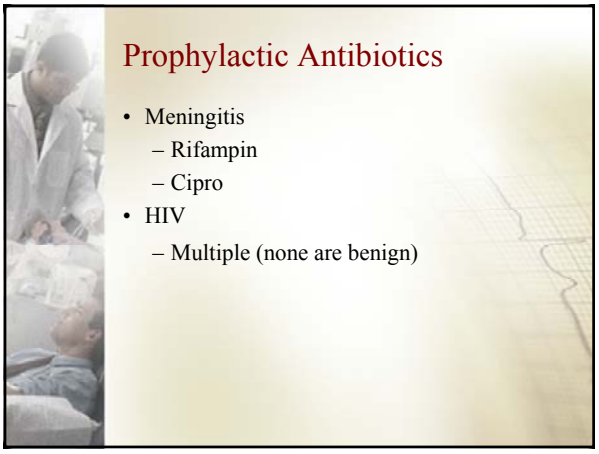
Procedure

- Immediate washing and disinfecting
- Medical evaluation
- Immunizations
- Prophylactic antibiotics
  - Indicated prophylactic antibiotics and immunizations
- Incident report (documentation of circumstances)
- Notification of occupational health / infection control



Immunizations

- Hepatitis B (No Hep A protection)
  - Active - vaccine
  - Passive - HBIG
- HIV
  - Active - *not* available (experimental trials)
  - Passive- specific IG is *not* available



Prophylactic Antibiotics

- Meningitis
  - Rifampin
  - Cipro
- HIV
  - Multiple (none are benign)

Summary

We have discussed:

- The components and benefits of fitness training, including cardiovascular endurance and its stress reduction benefit.
- The calculation of target heart rate and using this as the best determinant of aerobic conditioning and cardiovascular endurance.
- A quick review the basics of proper and improper lifting.
- A quick review of infectious disease prevention and body substance isolation steps to take for personal protection from airborne and bloodborne pathogens.