GEHS Trailblazers Cross Country

Training Theory

Physiology

Muscles need oxygen and energy

- Oxygen is carried by the blood (hemoglobin)
- Energy is ATP: ATP = glycogen = carbohydrates

Aerobic and Anaerobic Systems

- Aerobic = longer duration, lower intensity energy system
- Anaerobic = shorter duration, higher intensity, produces lactic acid
- Races and some workouts are a combination of both systems
- 10k = 90% aerobic, 10% anaerobic; 5k = 80% aerobic, 20 % anaerobic

Anaerobic Threshold (A/T)

- The pace at which lactic acid accumulates - anaerobic system kicks in
- The higher your A/T, the faster pace you can run without lactic acid and the longer you can endure a certain pace.
- HR = 170-180
- Pace = 15 seconds/mile slower than 10k RP or 40 sec./mi slower than 5k RP
- Lactic acid builds up and respiration increase sharply at and beyond the A/T.

Aerobic Threshold

- The pace at which begin to train the aerobic system
- Heart rate (HR) = approximately 140
- You must reach this threshold in order to get a training effect

Max $V0_2$

- the maximum amount of oxygen the body can take in and use (aerobic power)
- the higher your VO2, the more aerobic work per second you can do.
- HR = approximately 190-200 when you are right at max v02
- Pace = approximately 5k RP

Anaerobic Power

- ability to generate anaerobic work and tolerate lactic acid build-up.
- all races require some anaerobic power (short kick or long, hard drive)

Workouts and Their Purposes

1. Easy and moderate runs: increase general aerobic conditioning, build a base.
2. Long (60 minutes or more) easy runs: increase capillarization and efficiency of fuel utilization, cause psychological callusing effect.
3. A/T runs: raise the anaerobic threshold, cause psychological benefits from dealing with discomfort for longer periods of time.
4. Fartlek: transition from aerobic to anaerobic training, improve ability to change pace.
5. Long reps: raise max V02, teach body and mind race pace.

6. Medium to short reps: increase anaerobic power, finishing speed, ability to tolerate lactic acid, heart stroke volume, efficiency at race pace.
7. Hill reps: increase strength/ endurance for XC, anaerobic power, and tolerance of lactic acid.
8. Short Sprint: improve max speed, overall sharpening for peak.
9. Strength training: improves speed and running economy, prevents injuries.
10. Flexibility training: improves range of motion for increased speed, prevents injuries.