THE EFFECTS OF AGING ON RUNNING PERFORMANCE

FURMAN INSTITUTE OF RUNNING & SCIENTIFIC TRAINING (FIRST)
At What Age Do Runners Begin to Slow?

- Sprinters slow at an earlier age.
- Endurance athletes begin to slow in the mid- to late 30s.
- The rate of decline increases with aging.
What Are the Reasons for the Performance Decline?

- Reduced Aerobic Capacity
- Injury
- Reduced training volume
- Reduced intensity
- Psychological factors
- Physiological factors
- Cultural factors
Physiological Factors

Three factors -- maximal oxygen uptake, lactate threshold, and running economy -- are the primary determinants of distance-running performance.

The primary factor responsible for lower $\text{VO}_2\text{max}$ is a lower maximal heart rate.
Physiological Factors

Max $\text{VO}_2 = \text{Cardiac Output \ (Stroke Volume \times \text{Heart rate}) \times \text{peripheral oxygen extraction (arteriovenous oxygen difference)}}$

Highly trained aging runners appear to be able to maintain their stroke volume and peripheral oxygen extraction.
Physiological Factors

Lactate threshold, as a percentage of \( \text{VO}_{2 \text{ max}} \) may increase with aging.

There are few data to substantiate that there are changes in running economy for aging (aging per se does not alter the oxygen cost to perform a given workout).
Training Volume and Intensity

Aging affects the ability to sustain training intensity.

Aging affects recovery.

Reduced frequency and intensity impair the optimal maintenance of physiological factors that determine performance.

Aging affects body composition.
Aging and Flexibility

- Connective tissues between muscles and bones become more rigid with aging.
- The restriction in the range of movement at major joints used in running will diminish running speed by reducing stride length.
- Poor flexibility increases the risk for injury.
- Injury leads to a decrease in training frequency, duration, and intensity.
What Is the Rate of Performance Decrement?

Research indicates that runners who remain highly fit can expect a 0.5 to 1 percent decline in performance per year from age 35 to 60. After age 60, performance decrement tends to increase at a faster rate.

Vigorous training reduces the decrement by approximately half from the relatively sedentary individual.
Age Graded Tables

- Based on the world record for that age.
- Calculates the assumed rate of performance decline based on age.
- The annual estimated performance decrement is approximately 0.7 percent, with the decrement percentage gradually increasing with age.
Age Graded Example

53-year-old male who runs a 3:05:30 marathon would have a Performance Level Percentage of 76.7 percent. This percentage was obtained by dividing the world record of 2:22:21 for a 53-year-old male by 3:05:30.

This time of 3:05:30 would convert to an equivalent prime-age performance of 2:45:17.
Age Graded Tables

Website:
http://misweb.cbi.msstate.edu/~rpearson/masters.html
Aging Questions

- How can it be minimized?
- Is the Performance loss inevitable?
- Should training be modified for the aging runner?
- Why does the rate of decline accelerate with aging?
Aging Considerations

- Few can maintain the same level of training after 50.
- Consider less frequent training with lower volume, but maintain intensity.
- Cross train
- Stretch!
- Weight train.
- Maintain healthy body weight
Discussion?
Comments?
Q & A

Thank You