

# THE EFFECTS OF AGING ON RUNNING PERFORMANCE



**FURMAN INSTITUTE OF RUNNING & SCIENTIFIC TRAINING**

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# 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  $\dot{V}O_2$  = Cardiac Output (Stroke Volume x Heart rate) x 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.

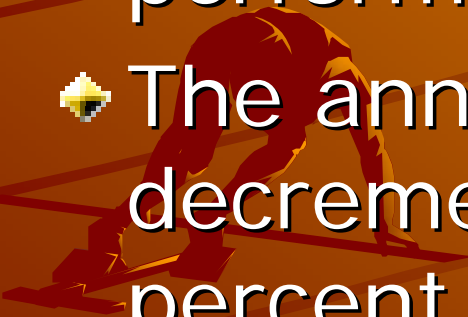


# What Is the Rate of Performance Decrement?

- ◆ 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 .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



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Discussion ?  
Comments ?  
Q & A

Thank You

