

Sports Medicine Update

Casper Orthopedic Associates

"Exercise Program Design"

Matthew E. Mitchell, M.D.

www.mattmitchellmd.com

February 2010



Background

Energy pathways can be broadly categorized as either **aerobic** (using oxygen) and **anaerobic** (absence of oxygen). The 3 basic kinds of exercise emphasize **speed**, **power**, or **endurance**. Speed and power may be maximized by building anaerobic pathways while endurance may be maximized by aerobic pathways.

The lactate threshold occurs when the aerobic pathway has been maximized. Training, especially endurance, (running, jogging) increases the lactate threshold.

There are 2 basic types of muscle fiber (**slow** and **fast**). Slow muscle fiber encourage endurance while fast encourage speed and power. In general, the proportion of slow v fast muscle fiber is genetically determined. But training can increase the size and efficiency of individual fibers. Muscles can be sore because of lactate build up which occurs in minutes or can be delayed because of muscle fiber injury.

Exercise Prescription

The American College of Sports Medicine recommends target heart rate of (220- the age) multiplied by 55-90%. Beginners should start at 55% while more experienced athletes can attain 90%.

Resistance training should be done at least 2 days per week with 8-10 exercises of 15 repetitions. Athletes should be able to accomplish 2 sets before increasing resistance.

For people with lower extremity injuries, pool running and Pilates (abdominal and upper

body strengthening) can be utilized.

The beneficial effects of **stretching** are controversial. Most fitness trainers recommend stretching before and after exercise although little scientific evidence supports this. A stretching program independent of strengthening may have some scientific support.

Exercise can increase blood pressure and demands on the cardiovascular system. Athletes should consult their **health professional** before embarking on an exercise program.

Conclusion

Exercise provides psychological as well as other health benefits. A properly designed program can improve self-esteem and help with weight reduction. Further more, diabetes and other medical conditions may be improved by proper exercise. It is estimated that 30% of Americans are obese and this is one of the highest rates in the world. Athletes and patients should consult their health professional for a properly designed exercise



Email: mattmitchell@mattmitchellmd.com
Member Wyoming High School Activities Sports
Medicine