

## The Energy System Continuum

- A. Imagine every energy system being on a continuum.
- B. An easy way to know what system your in is by monitoring your heart rate. Your heart is your engine, so finding out your BPM's is important.
- C Some energy systems blend into others very quickly so be aware of that. Focus on what system you have sustained over a period of time.

Recovery_____	C.P._____	Aerobic _____	A.T. _____	AnT_____	VO2MAX_____	Lactate
H.R.=Under 120 Phosphate	Creatine Phosphate H.R. =180 or higher	Aerobic Capacity H.R.=120-140	Aerobic Threshold H.R.=140-160	Anaerobic Threshold H.R.=160-180	Maximum Oxygen Uptake H.R.=180 or higher	Lactate Production H.R.=Max of your age

**Recovery:** Usually involved in warm-up and warm-downs. Easy, smooth swimming. Nice time to do some drills and repair your strokes.

**Creatine Phosphate:** Pure explosiveness! ALLOUT EFFORT FOR 12 seconds or less. Great for sprints, out-sprinting someone on a turn or finish and overall explosive power.

**Aerobic:** The most important energy system for overall fitness and fat burning capability. Having a huge aerobic capacity will enable you to endure through the long meets and distance races. This is very important for young swimmers ages 11-13 to develop their aerobic capacity when they become senior swimmers.

**Aerobic Threshold:** Producing lactic acid and displacing it evenly through oxidation and the Kreb cycle. Strong and smooth swimming, a nice slow burn. Still in the aerobic system but at a more elevated heart rate. Some of these systems will blend into each other based on the duration, effort and rest factors.

**Anaerobic Threshold:** Producing lactic acid quicker than your body can displace it. Helping your system with buffering lactic acid, depending on duration. Swimming a strong effort with a H.R. around 160-180 bpm depending on age and fitness level.

**Maximum Oxygen Uptake (VO2Max):** Lactic Acid levels are approaching peak levels and you are making the most dramatic impact on your fitness, speed, power. A 2-1 to a 4-1 ratio of rest to work needed here. Heart rate usually over 180!

**Pure Lactate:** 100% efforts of 30 seconds or more with usually a 4 to 1 to 6-1 ratio of rest to work needed. This is the energy system which enables you to buffer lactic acid and become more tolerant to it. This system will improve your aerobic power dramatically. Very important for competing in multiple events in a short period of time.

