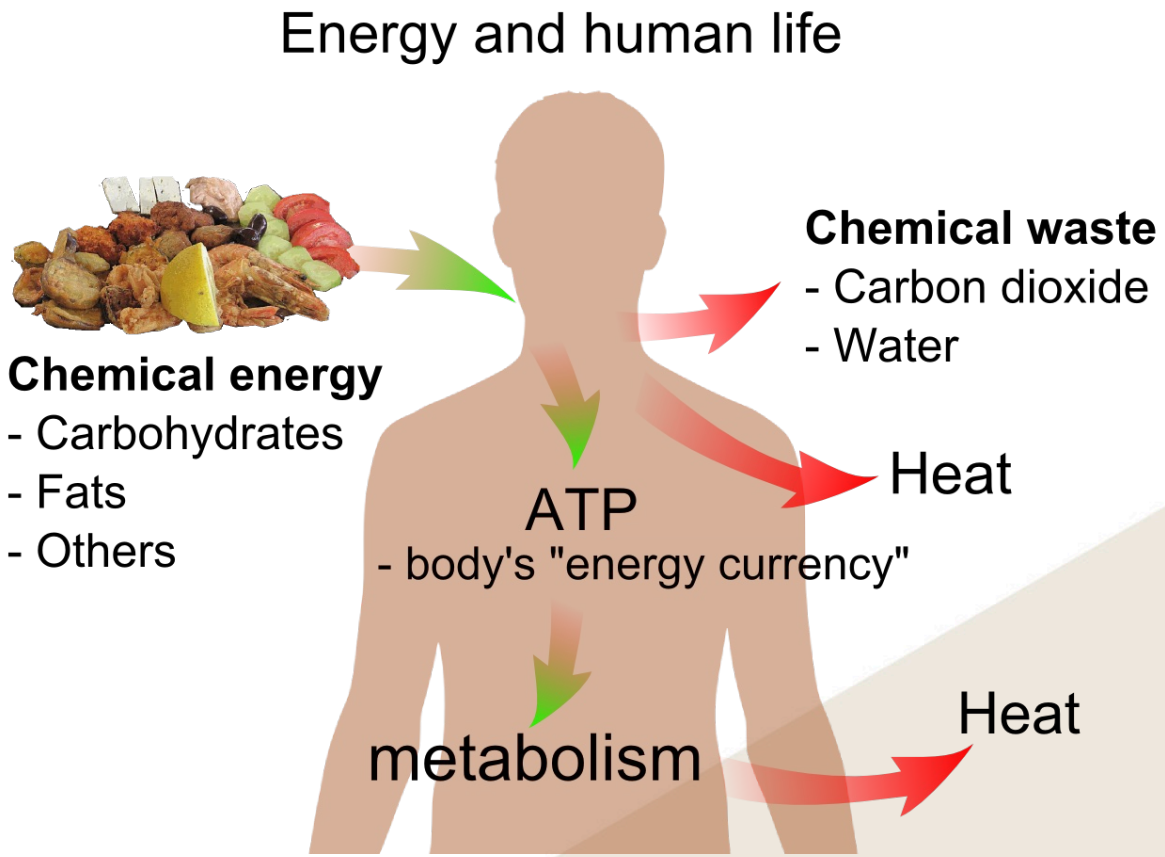
Energy Systems / Training

Craig Robertson

Swim England Swimming

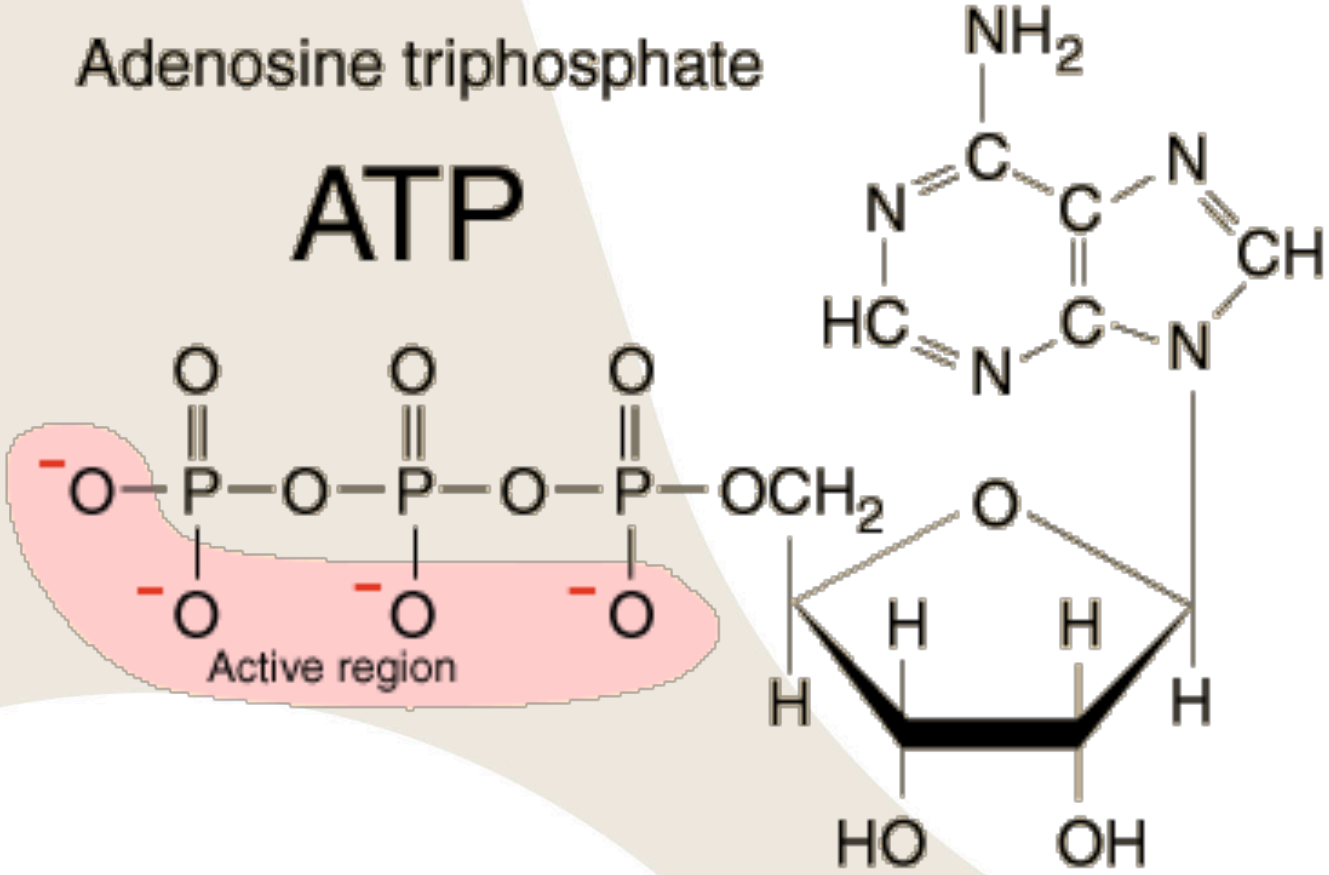
Where Does Energy Come From?



The Energy Currency

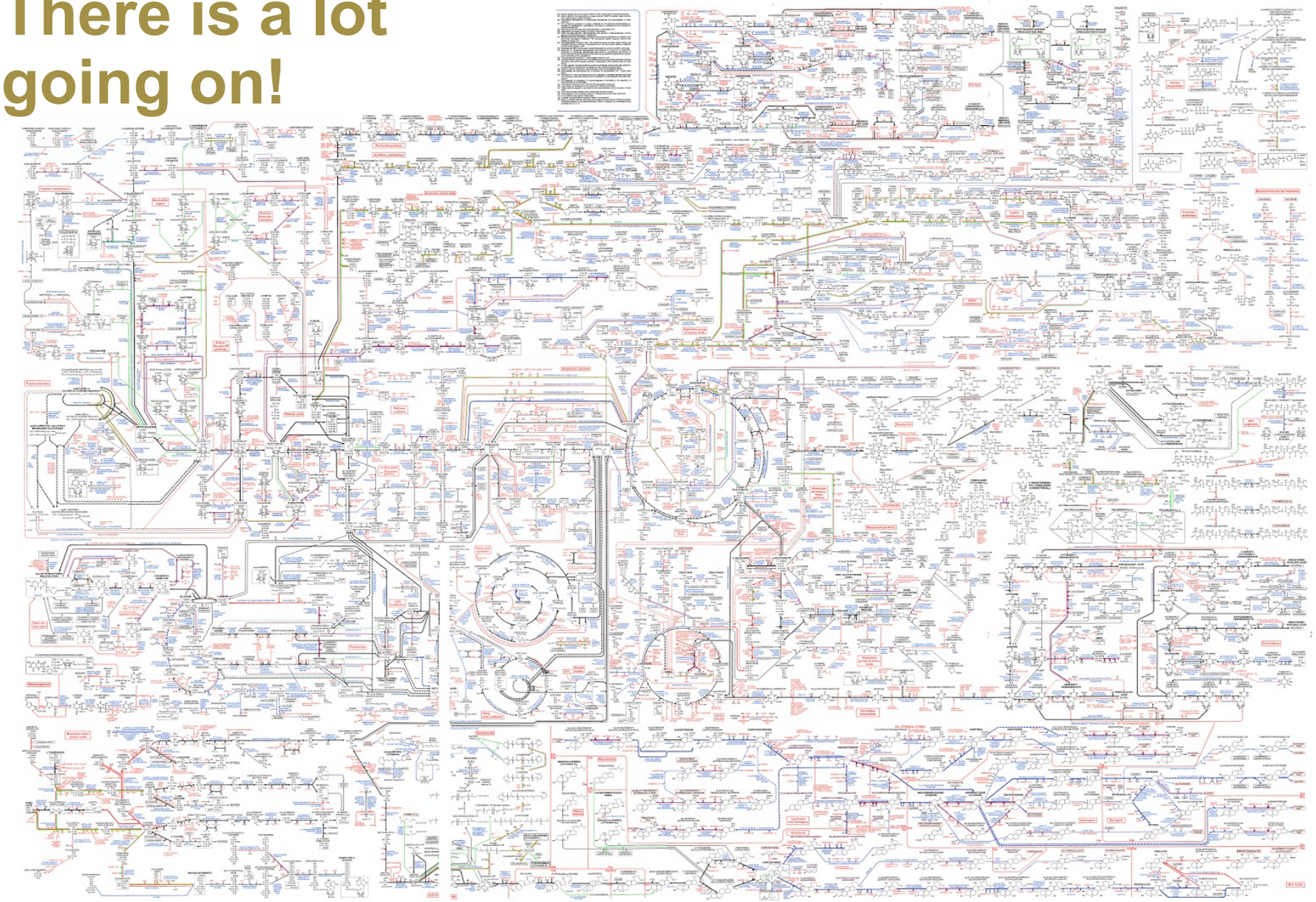
Adenosine triphosphate

ATP



Types of Energy Systems

There is a lot going on!



Types of Energy Systems

Anaerobic Exercise

ATP/PC

(Phosphagen)

Lactate System

(Glycolytic)

Aerobic Exercise

Aerobic System

Duration of Exercise

Speed of Energy

Types of Energy Systems

Anaerobic Exercise

ATP/PC

(Phosphagen)

Speed of Energy: Immediate

Duration: 0 – 10s

Fuel: Stored ATP/PC

Yield: 1 x PC = 1 x ATP

Lactate System

(Glycolytic)

Speed of Energy: After ~10s

Duration: 10 – 90s

Fuel: Glycogen/Glucose

Yield: 1 x GLY/GLU

= 3/2 x ATP

Aerobic Exercise

Aerobic System

Speed of Energy: After ~90s

Duration: 90 s +

Fuel: Glycogen/Glucose/Fat

Yield: 1 x GLY/GLU

= 36 (38 with La Sys) x ATP

(1 x Fat = 130 ATP)

Duration of Exercise

Speed of Energy

Racing Events

Anaerobic Exercise

ATP/PC

(Phosphagen)

Lactate System

(Glycolytic)

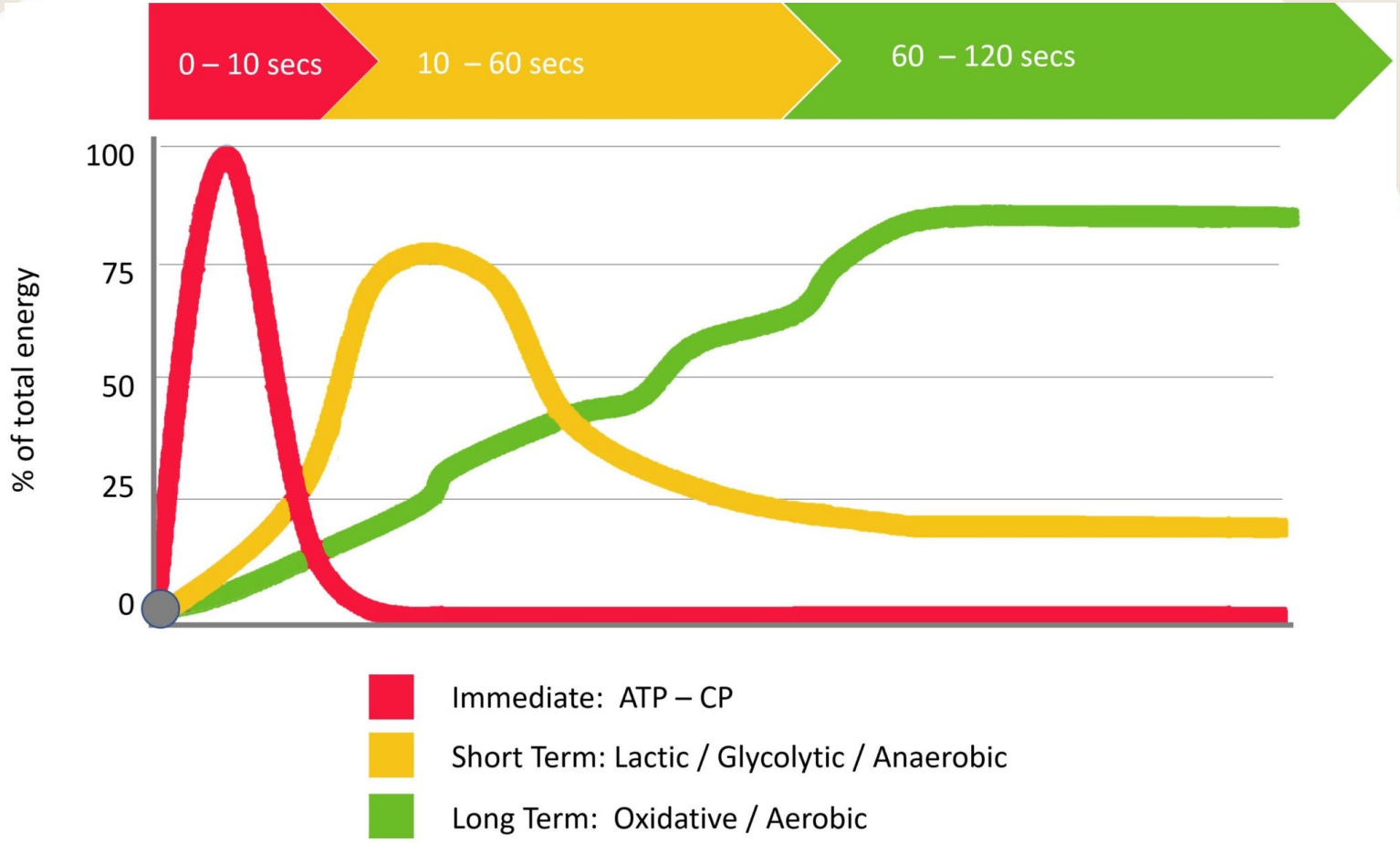
Aerobic Exercise

Aerobic System

Duration of Exercise

Speed of Energy

Working Together!



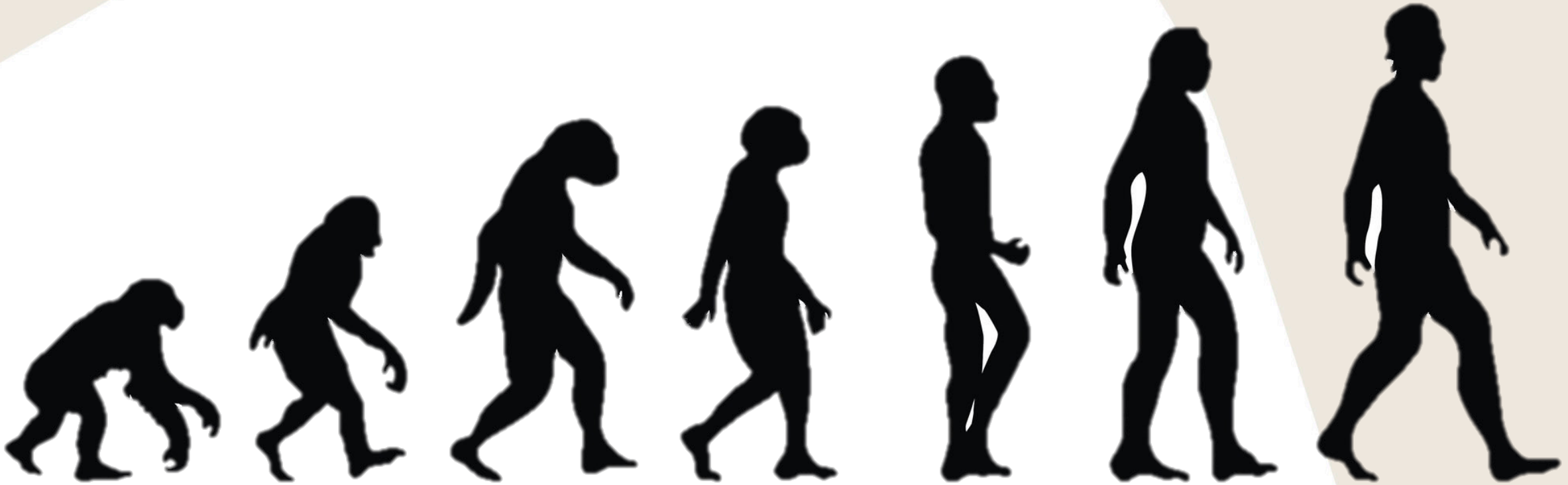
Working Together!

Distance*	Phosphagen (%)	Glycolytic (%)	Aerobic (%)
50 m	15-80	2-80	2-26
100 m	5-28	15-65	5-54
200 m	2-30	25-65	5-65
400 m	0-20	10-55	25-83
800 m	0-5	25-30	65-83
1,500 m	0-10	15-20	78-90

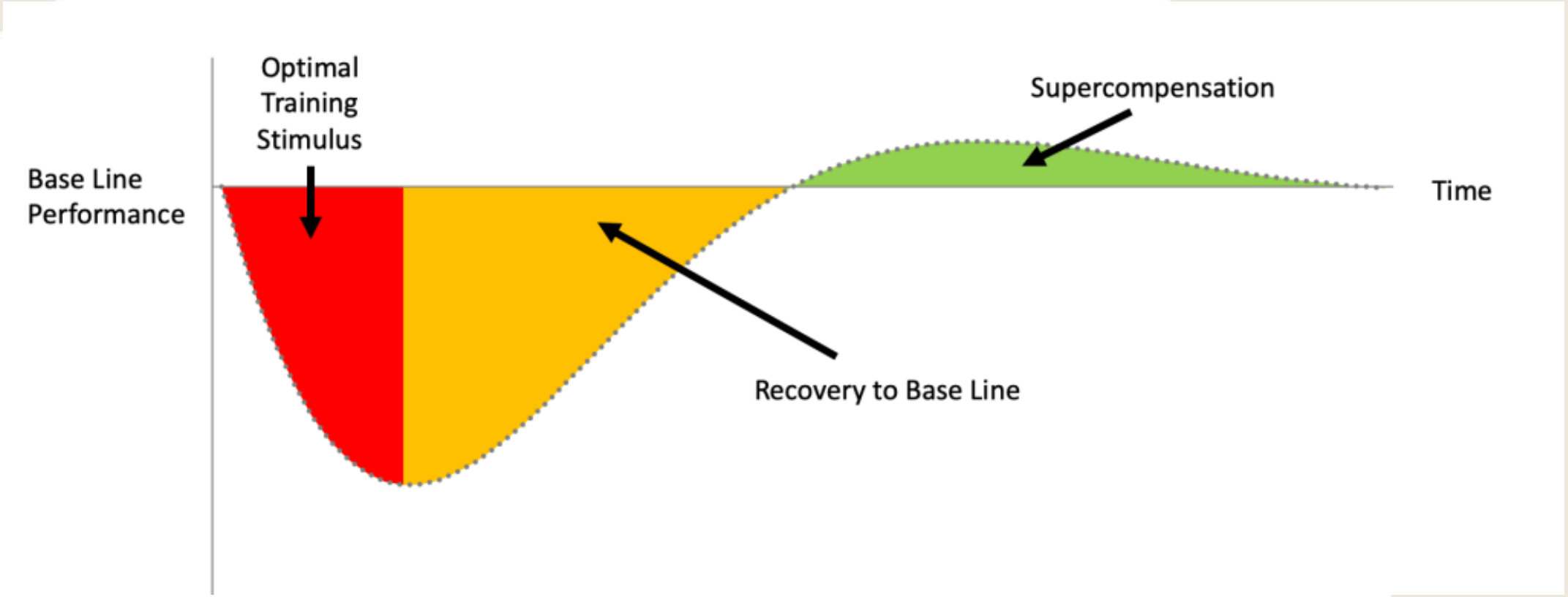
All Systems work together all of the time.

The Aerobic System is essential for all events above 50m.

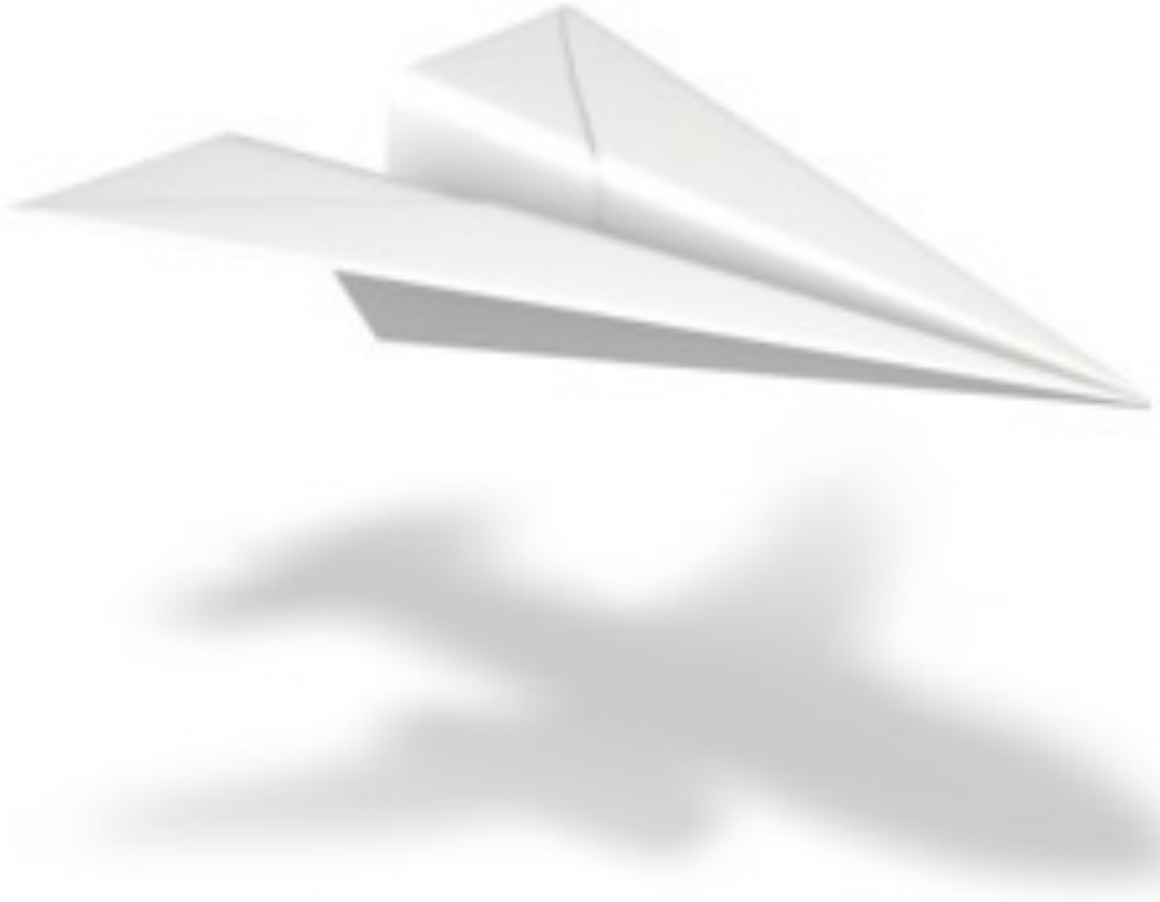
Adapt to Thrive



Adapting to Training



Structure



Function

Training to Build Structures

“Capacity Training”

Higher Volumes

Low Intensity

Larger Distance Repeats

Shorter Rest Short Repeats

Long Term Improvements

Put the Structures in place to enable you to both race and recover FAST.

Training to Improve Function

"Power or Utilisation Training"

Higher Intensity

Lower Volume

Fast Improvements – Short Term

Improves the function of the body structures that are in place

Capacity vs Utilisation

- What is the aim?
- Are you training for Adaptation

(The Future)

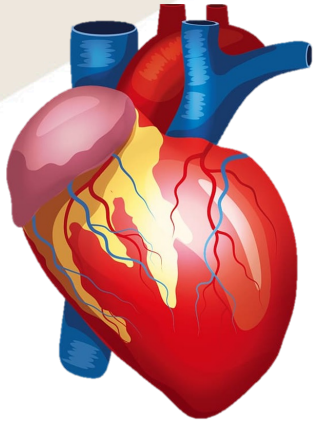
- Or
- Are you training to race?

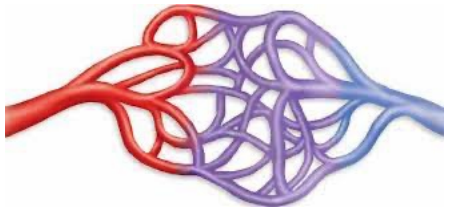
(The Present)

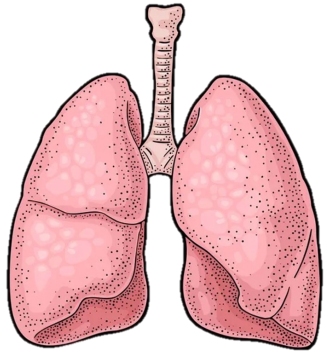
“Build the Foundation!”

Aerobic Adaptations

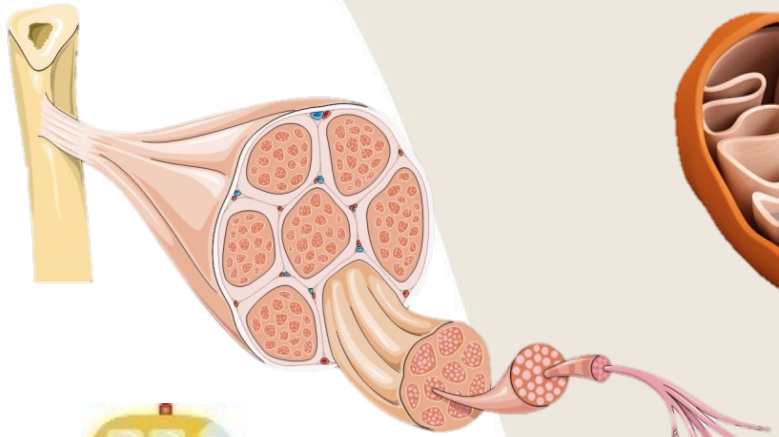
Take in & Deliver







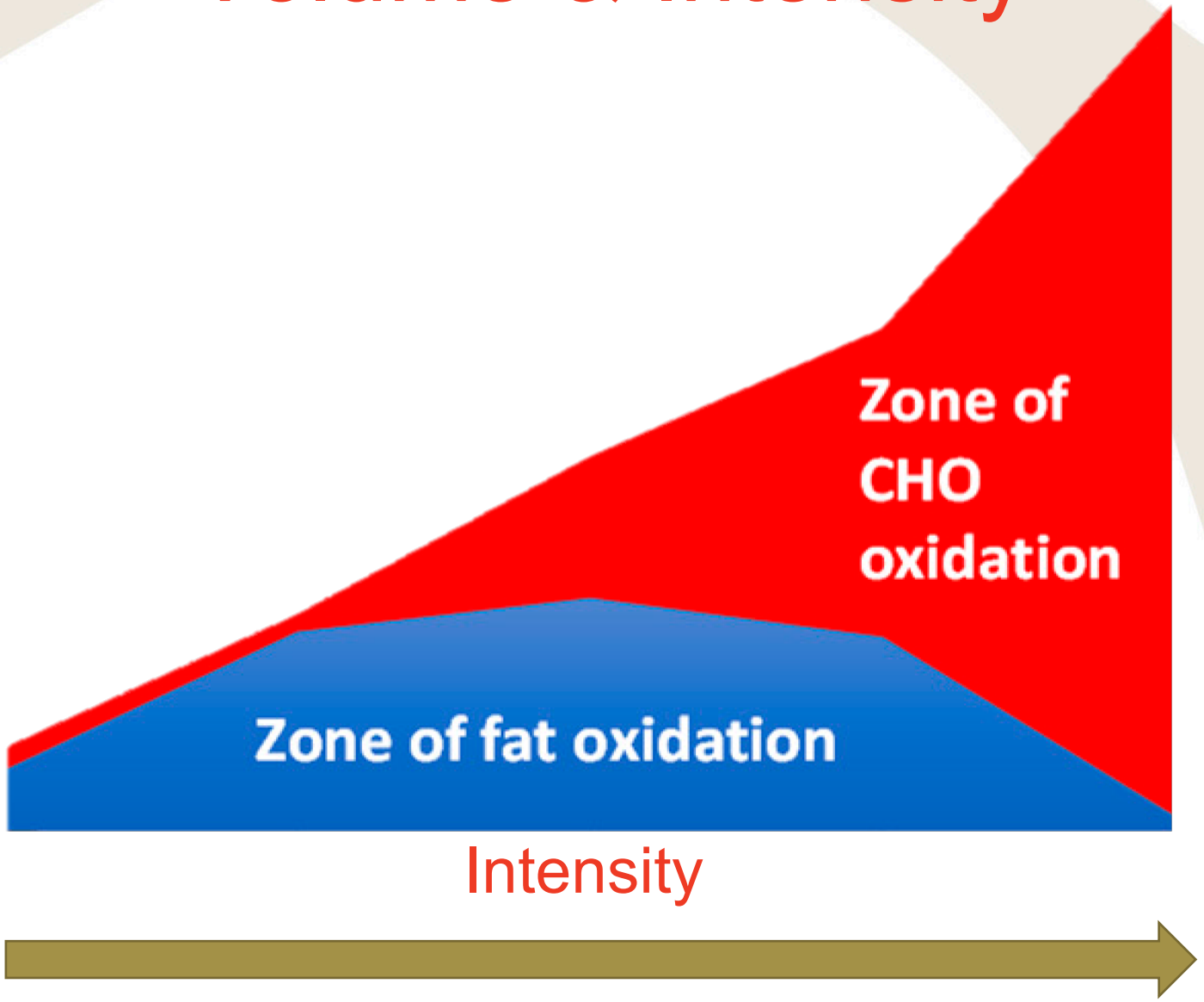
Use



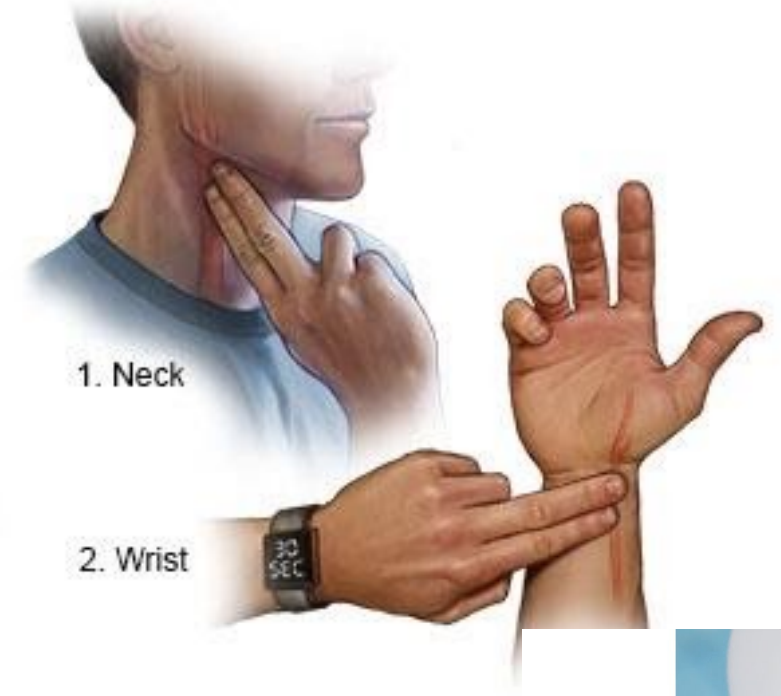
MCT1

MCT4

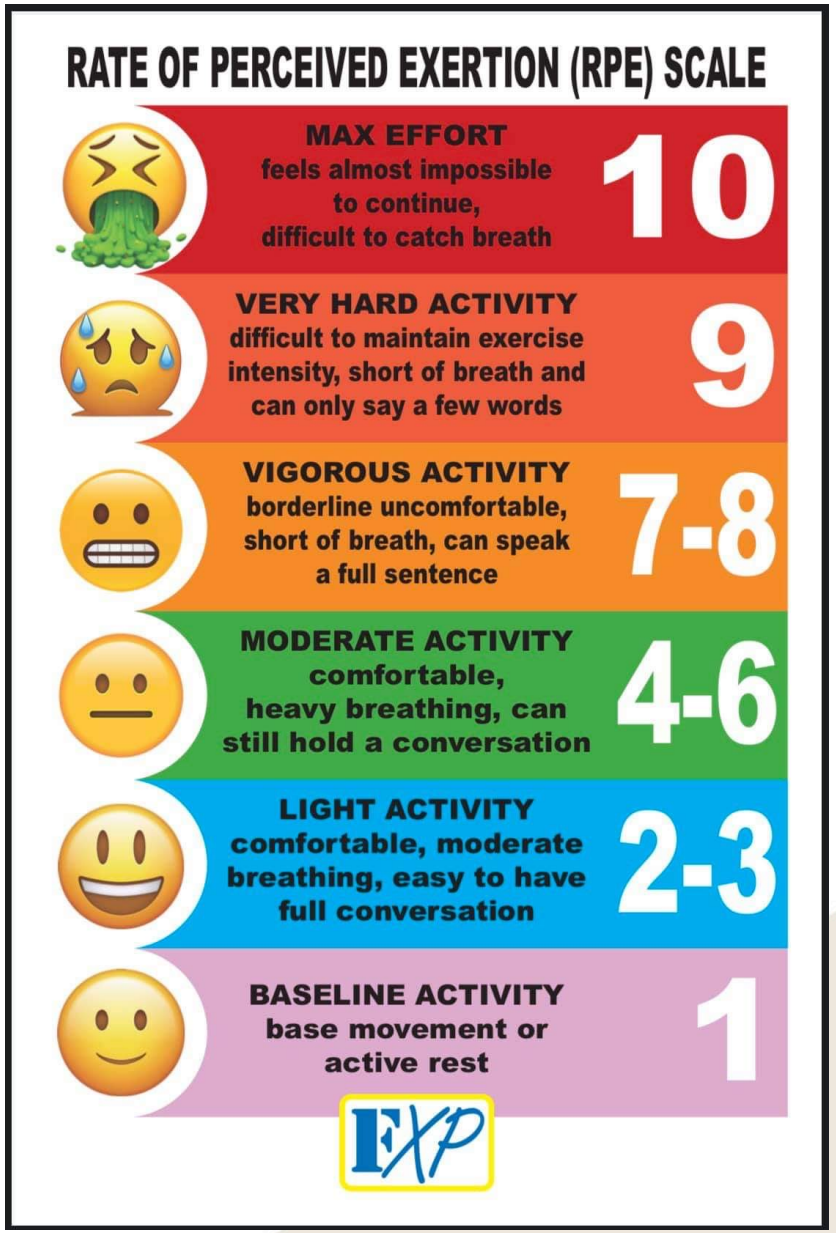
Volume & Intensity



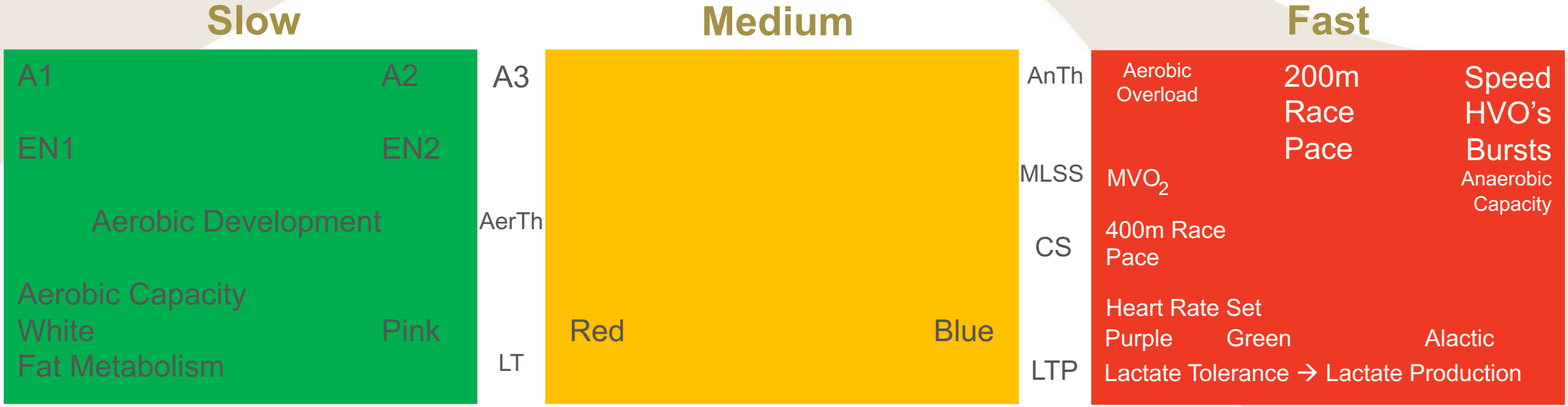
How Will I Know?



How to Take Your Pulse



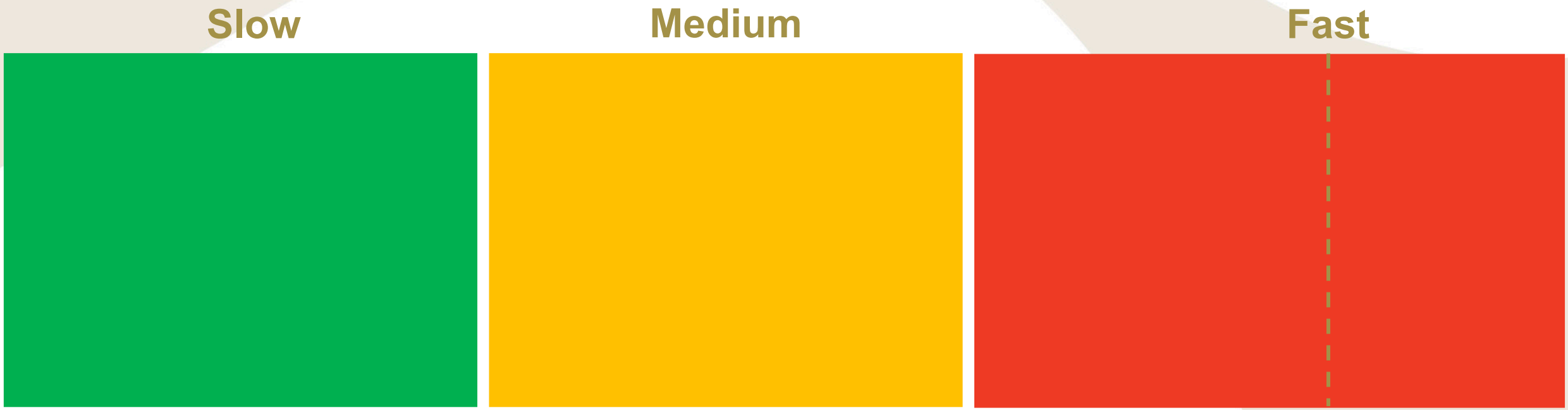
Training Zones – Coach Language!



Intensity

Volume

Training Zones – Set Examples Activity



Go through your training week and try and understand your sets, why you do them and what energy systems are being used.

How does the Volume/Intensity affect your scores on Metrifit?

“There is no race day magic that lets you outperform your physiology”