

**2019 NSCA HOCKEY  
STRENGTH & CONDITIONING  
CLINIC & LIVE STREAM**



# Conflict of Interest Statement

I have no actual or potential conflict of interest in relation to this presentation.

# Bridge the Gap: Understanding Energy System Development in Hockey

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# Thank You

**Scott Caulfield &  
The NSCA**

**Coach Eric Renaghan &  
The St. Louis Blues**



# My Expert Line



Coach Devan McConnell  
UMass Lowell



Coach Rick Bennett  
Union College



Coach Kevin Gately

# My Mentor Line



Dr. Jim Kellogg  
"JK"



Kevin Martin

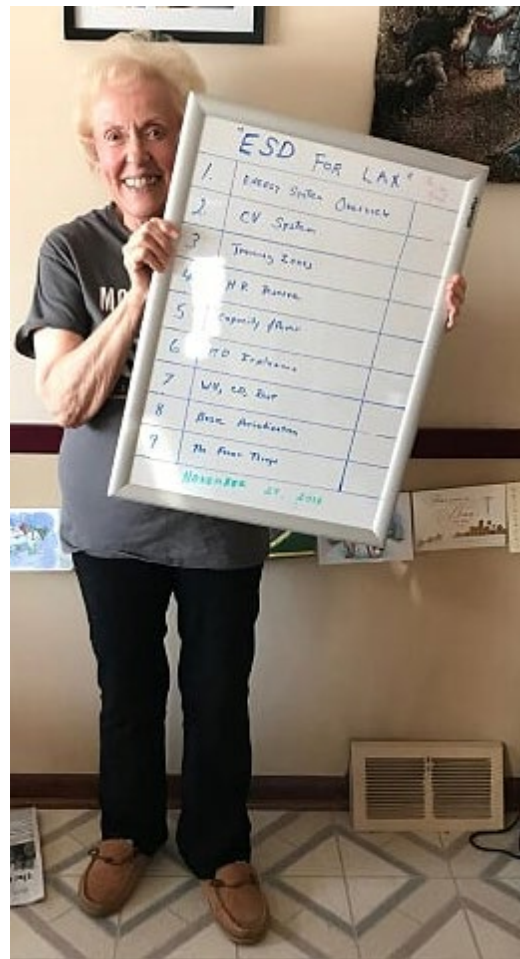


Mitch Lemelbaum

# The MDR Line



My Wife Rachel



Mom



Dad

# Goalie



Jared Thames

# A Brief Review of the Metabolic Pathways

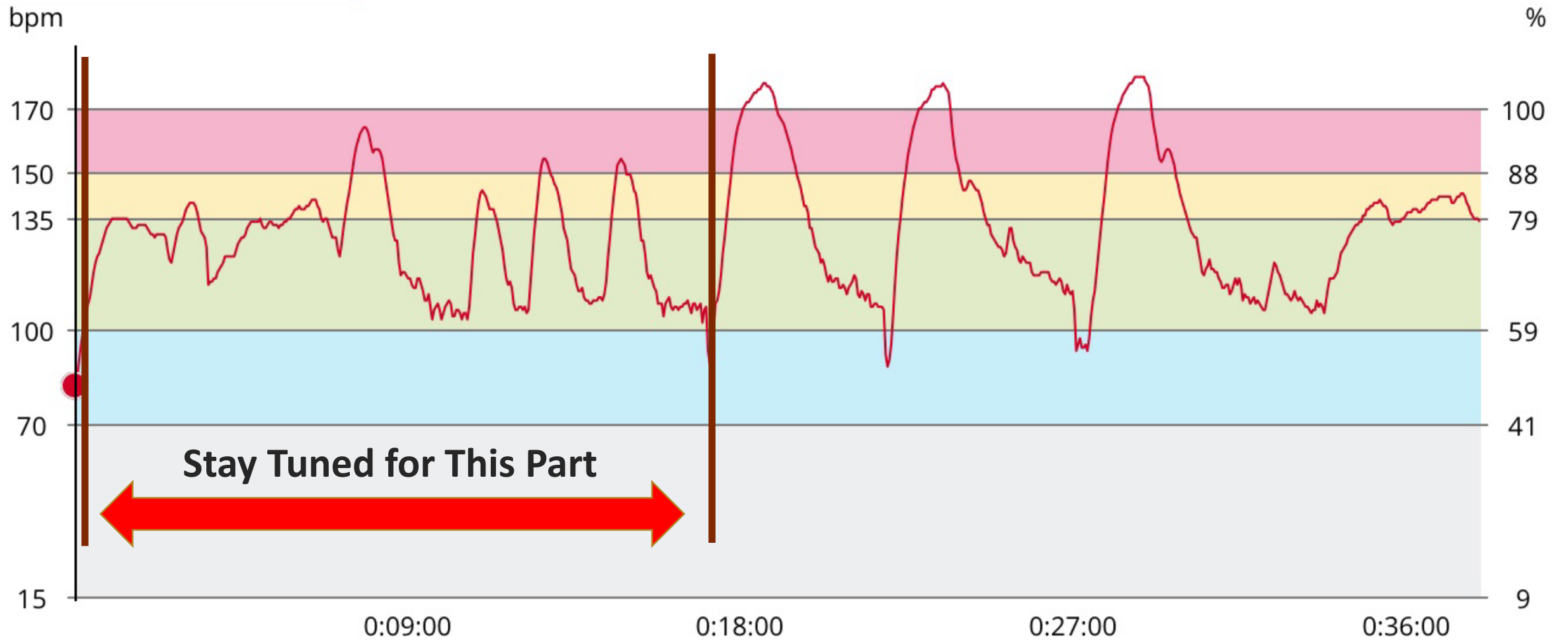
1. Alactic
2. Lactic
3. Oxidative
  - Glycogen
  - Lipids

Note:

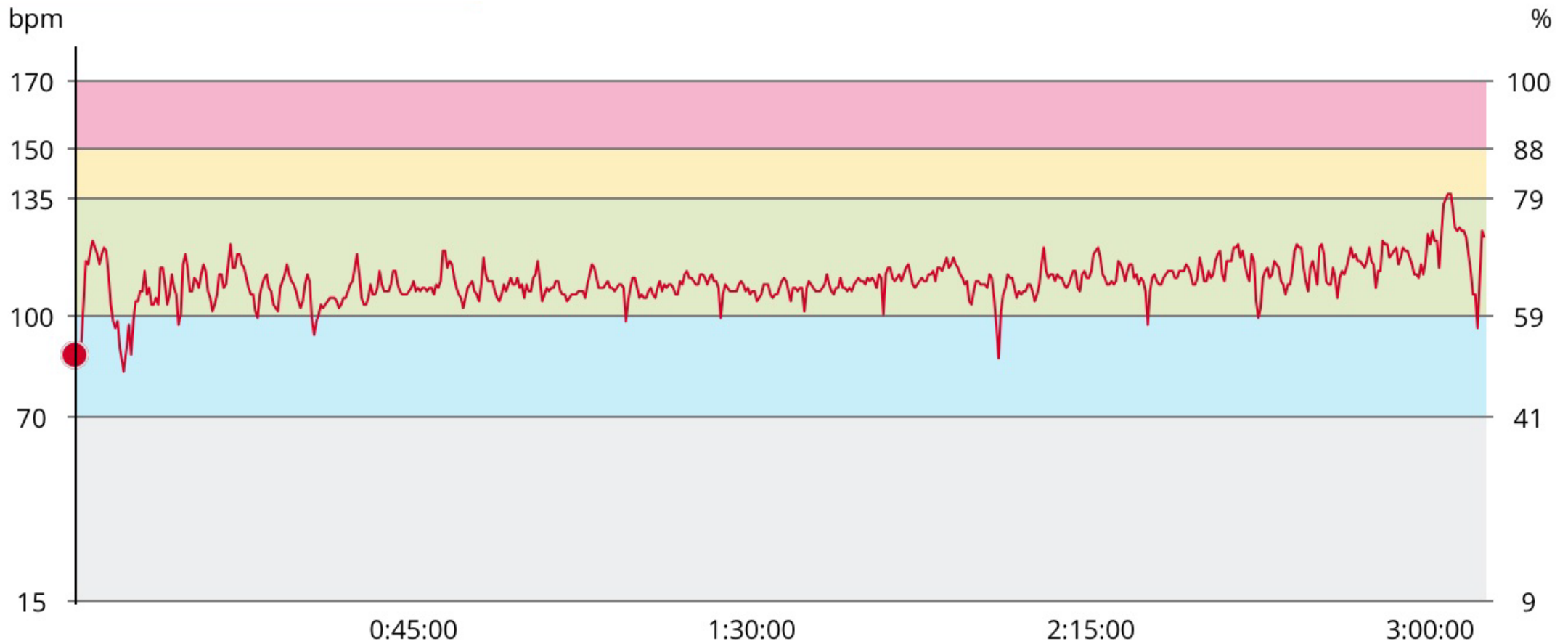
All three systems are operating in the body all the time.

However only one dominates energy production.

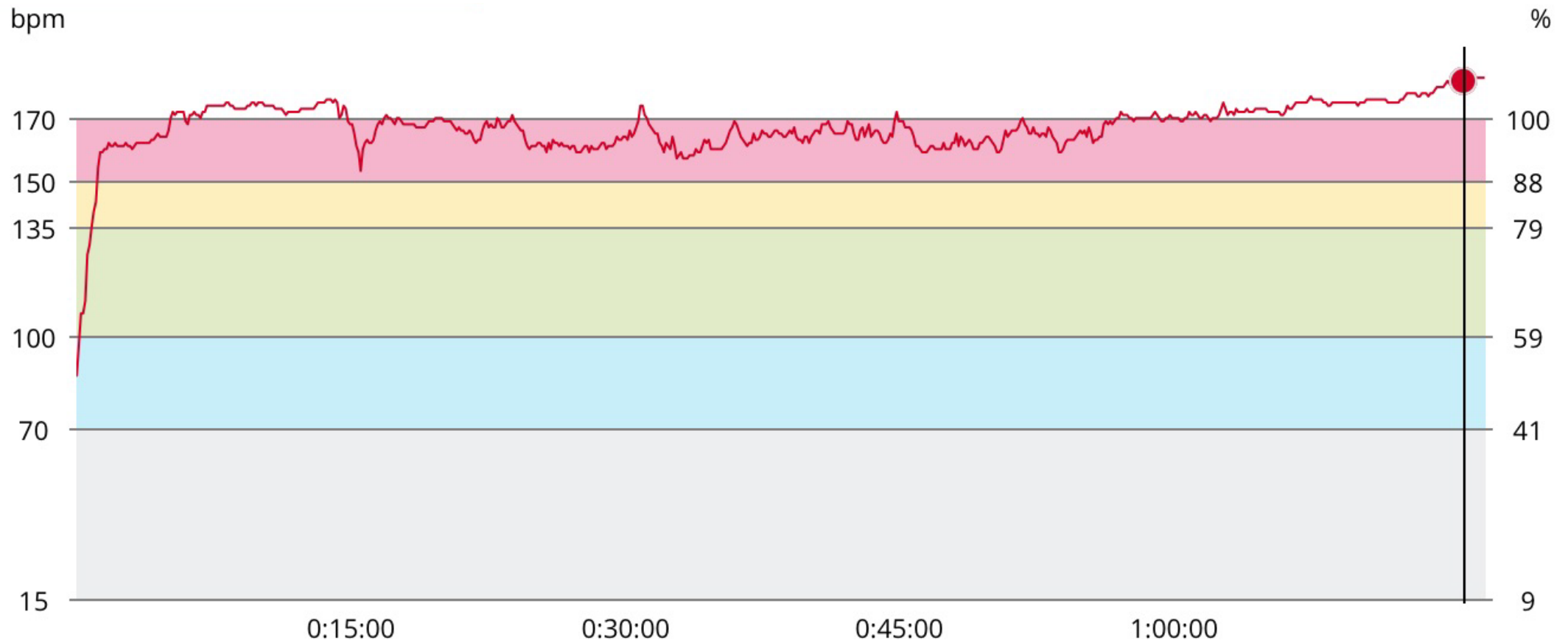
# Standard Issue Lactic Work



# Beta Oxidation at its Finest



# What's Going On Here?



# What Hockey Does Right

## 1. Culture

- The 3 T's
- “Hockey starts on time”
- Sharing of knowledge & best practices

## 2. Use of technology

- Polar Activity Monitoring
- HRV

## 3. Workload balancing

- Attempting to ensure everyone on the team has the same level of fatigue at the end of each day

## 4. Micro-intervals

- Repeat sprint ability
- Alactic-aerobic

# What Endurance Training Can Contribute to Hockey

- Long term success is predicated on a strong aerobic system
  - Essentially in GPP all year
- The concept of Aerobic Support
- Use of different modalities: run, bike, elliptical, pool
- A steady diet of LSD is not the answer
  - Long intervals
  - Circuit training

# My Year With Brian Kiprop



# What I Learned

1. Importance of aerobic support and speed development
2. Appreciation of different cultures
3. Understanding a different motivation
4. Lack of facilities is not an excuse
5. Coaching is a give and take process
6. Reinforced the importance of symbiotic relationships

# Speed & Aerobic Support

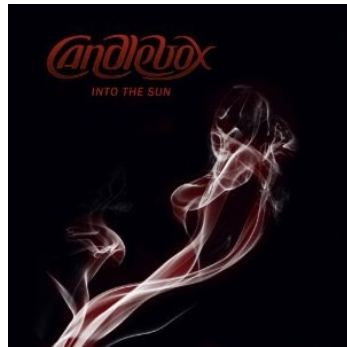
**SPEED**

400m

800m



1500m/5000m



10k – Cross Country

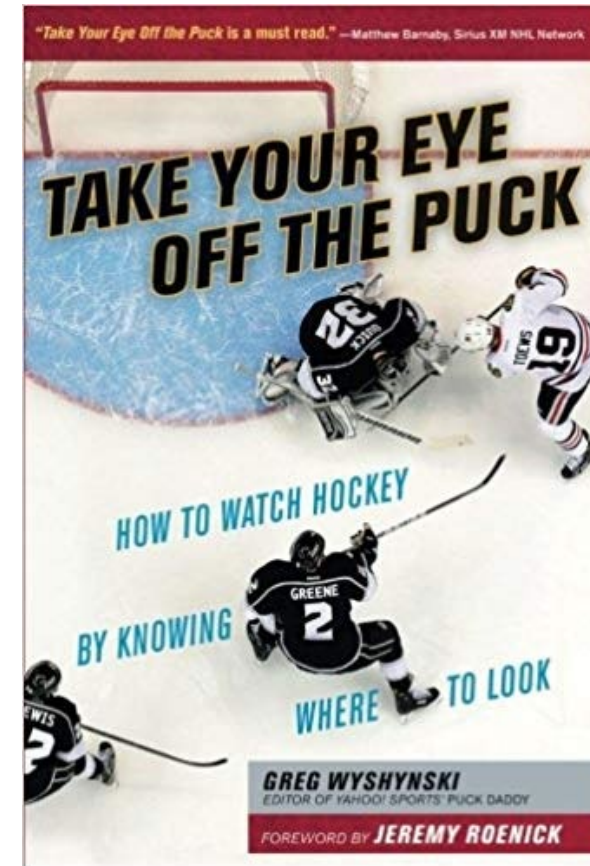
Marathon

**STRENGTH**

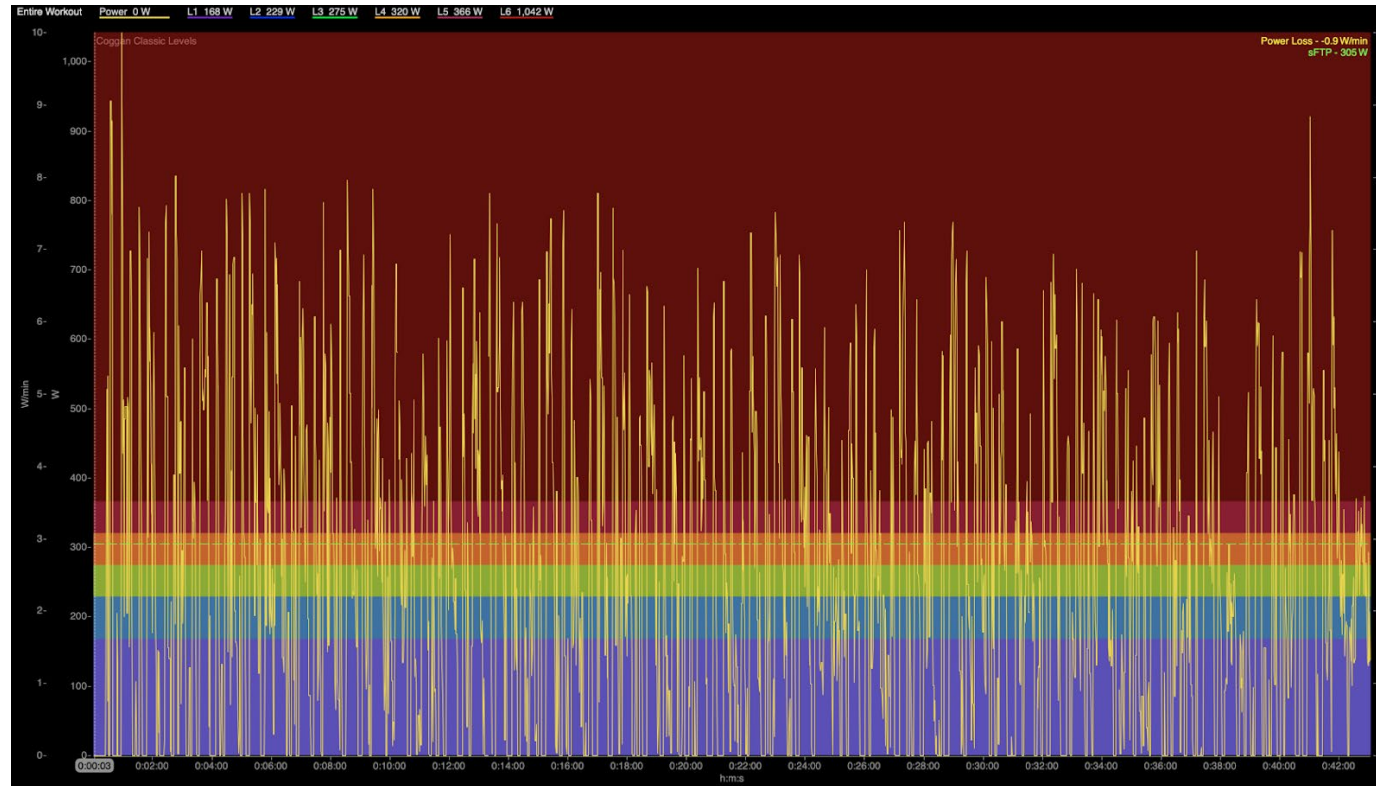
To determine the energy system being used  
take your eye off the puck

Is it lactic?

Is it alactic-aerobic?



# Repeat Sprint Ability is Built on Aerobic Capacity



## Notes

- Max power in a fully recovered state was 1300W
- 1<sup>st</sup> sprint was 1042W
- In the last 15 min best acceleration was 727W
- Final sprint was 900W

Source: <https://www.trainingpeaks.com/blog/youre-training-too-hard-for-criteriums-heres-why/>

# Key Training Principles

- Individual Response
- Variation
- Pareto's Law
- Minimum Effective Dose



# Thelonious Monk shaves with Occam's Razor



“Simple ain’t easy”

## Occam's Razor

When two solutions to a problem are presented, the simplest solution is the preferred choice.

# Thelonious & Occum Applied to Conditioning

## Heart Rate Training Zones

### Red

- High intensity
- +90% MHR

### Yellow

- The No Zone

### Green

- Aerobic Zone
- HR (180-age) to 99

## Desired Training Effect

### Power

- Ability to do work quickly
- Full recovery
- HR to 99

### Capacity

- Repeated efforts with incomplete recovery
- Incomplete recovery
- HR to 180-age

# Determining Heart Rate Zones

## Maximum Heart Rate

$$\text{MHR} = 220 - \text{age}$$

- Good estimate in the absence of testing

## Upper Bound of the Green Zone

$$180 - \text{age}$$

- High end of the “pure aerobic” zone
  - Add 5 beats per minute if athlete has trained consistently for 1+ years
  - Subtract 5 beats if the athlete has missed at least 4 weeks of training in the past year due to illness or injury



“Fatigue makes cowards of us all.”  
US Army General George S. Patton

# The ESD Demands for a Long *Playing* Season

- Maintain cardiovascular fitness
  - Chronic
    - College Hockey has the longest season
    - In 2019-20 the first day of the official season is October
    - Prior to that teams are limited to a total of 8 hours per week
    - Need to front load aerobic development during off season conditioning
  - Acute: 3x20 minute periods + 5 minutes overtime
  - The double edged sword of the Championship Chase

# Aerobic Conditioning in the Hockey World

- A measure of compete
- It can put the opposition on the conveyor belt
- Repetition of drills aids in ESD but can create boredom
  - Importance of a Drill Book
  - You can't do The Russian Paradox everyday
- The Metabolic Cash Out
  - Tuesday practice for NCAA Division I teams
  - Could be used with Black Aces

## doc Hickey

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