Training For Open Water Swimming
Marathon Swims

FINA 10K World Cup*
- 33 men, 32 women
- World championships
- 55-70 in each race

Olympics
- 25 in each race

<table>
<thead>
<tr>
<th>100yd pace</th>
<th>10K time</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.59</td>
<td>1hr 49m</td>
</tr>
<tr>
<td>1:02</td>
<td>2hr 1m</td>
</tr>
<tr>
<td>1:05</td>
<td>2hr</td>
</tr>
<tr>
<td>1:12</td>
<td>2hr 13m</td>
</tr>
<tr>
<td>1:20</td>
<td>2hr 26m</td>
</tr>
</tbody>
</table>

*10K World Cup, Eilat, Israel, 3/4/13
Outline

- Pacing in OW races
- Course Dynamics
- Training for a 2 hour event
- OW training outdoors/indoors
<table>
<thead>
<tr>
<th>Men</th>
<th>2K</th>
<th>4K</th>
<th>6K</th>
<th>8K</th>
<th>10K</th>
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<tr>
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Some notes:
## Pan Pac 10K 2010 women

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<th>6K</th>
<th>8K</th>
<th>10K</th>
<th>total</th>
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</thead>
<tbody>
<tr>
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<tr>
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</tbody>
</table>

[www.freshwaterswimmer.com](http://www.freshwaterswimmer.com)
**London Splits**

Mellouli’s splits showed how Mellouli powerfully pulled away from the field:

<table>
<thead>
<tr>
<th>Lap</th>
<th>Time</th>
<th>pace 100m</th>
<th>pace 100yds</th>
<th>Dist (k)</th>
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<tbody>
<tr>
<td>1</td>
<td>18:09.6</td>
<td>1:05.2</td>
<td>59</td>
<td>1.7k</td>
</tr>
<tr>
<td>2</td>
<td>19:06.4</td>
<td>1:08.6</td>
<td>1:02</td>
<td>3.3k</td>
</tr>
<tr>
<td>3</td>
<td>18:32.2</td>
<td>1:06.5</td>
<td>1:00</td>
<td>5.0k</td>
</tr>
<tr>
<td>4</td>
<td>18:34.8</td>
<td>1:06.7</td>
<td>1:00</td>
<td>6.7k</td>
</tr>
<tr>
<td>5</td>
<td>17:45.4</td>
<td>1:03.7</td>
<td>58</td>
<td>8.4k</td>
</tr>
<tr>
<td>6</td>
<td>17:46.7</td>
<td>1:03.8</td>
<td>58</td>
<td>10.0k</td>
</tr>
</tbody>
</table>

Ristov

Fast front end
Fast 5th & 6th laps

<table>
<thead>
<tr>
<th>Loop</th>
<th>Time</th>
<th>pace 100m</th>
<th>pace 100yds</th>
<th>Dist (k)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>19:22.2</td>
<td>1:09.5</td>
<td>1:03</td>
<td>1.7k</td>
</tr>
<tr>
<td>2</td>
<td>19:47.1</td>
<td>1:11.0</td>
<td>1:04</td>
<td>3.3k</td>
</tr>
<tr>
<td>3</td>
<td>20:00.1</td>
<td>1:11.8</td>
<td>1:05</td>
<td>5.0k</td>
</tr>
<tr>
<td>4</td>
<td>19:49.4</td>
<td>1:11.2</td>
<td>1:05</td>
<td>6.7k</td>
</tr>
<tr>
<td>5</td>
<td>19:33.5</td>
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<td>1:04</td>
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</tr>
<tr>
<td>6</td>
<td>19:05.9</td>
<td>1:08.5</td>
<td>1:02</td>
<td>10.0k</td>
</tr>
</tbody>
</table>

In comparison, Anderson’s splits were as follows over the 1.6km loop course: Loop 1 – 19:22.9 Loop 2 – 19:44.5 Loop 3 – 20:04.8 Loop 4 – 19:49.0 Loop 5 – 19:34.4 Loop 6 – 19:03.0 RISZTOV Eva 1:57:38.2

www.olympics.openwaterswimming.com
What does a race look like

- Salt Water or Fresh Water
- Lake, Ocean, River
- Shapes
  - 4-6 loops: 800-1000m x 70-200m
  - Narrow or wide shapes
  - Straight or bent shaped
- Hydration / Feeding Stations. Location? #?
Multiple Feeding Platforms
Up-Down-Across a River
Across a Lake
Point to point race (escorted swim)
Bent Shape London 2012

10km Marathon Swimming Course Plan

Diagram with labeled points:
- Start Pontoon
- Finish Gate
- Intermediate Timing Gate
Narrow bent
OW Nationals 2012
Narrow Straight OW Nationals 2013

Lower Castaic Lake
Course Detail (1640m)
Distances are approx.
10K = 6 Laps
5K = 3 Laps
U shaped! (WC 2013)
Open Water Race

Different course formats for every race
Lots of people
Long Race – 2 hours
Pace Changes a lot during race
What sport does this sound like?
Running!

FINA 10K World Cup*
- 33 men, 32 women
World championships
- 55-70 in each race
Olympics
- 25 in each race

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<td>2hr 1m</td>
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<td>2hr</td>
</tr>
<tr>
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<td>2hr 13m</td>
</tr>
<tr>
<td>1:20</td>
<td>2hr 26m</td>
</tr>
</tbody>
</table>
Marathon Running

Pool

1500m
WR Men 14min 31s
WR Women 15min 42s

Open Water

10K OW (no world records)
~ 1hr50’ Men
~ 2hr Women
**VO₂ Max?**

Endurance Performance
- VO₂ Max
- Lactate Threshold
- running Economy

*The best run at high % of Maximal aerobic power Without high lactate accumulation*

45ml/min/kg untrained

84 ml/min/kg Prefontaine

Marathon Runners
Not the highest VO₂
Can only maintain VO₂ max Intensity for a few minutes

What % of Vo₂ max can be maintained for a lengthy race (lactate threshold).

What speed can they hold when using O₂ at a given rate (running economy)

Will there be similar Differences between 1500 swimmers And 10K swimmers?

Training for a 2 hour Event?

Lydiard Method

To develop sufficient stamina to maintain necessary speed over the racing distance.

Necessary developments
1) aerobic capacity
2) anaerobic capacity
3) speed (=economy of action)
---one development comes after another in a systematic order

Long term view
your aerobic capacity can be developed further year after year. Aerobic development is what makes you a great runner, not anaerobic development

Marathon conditioning
10wks aerobic base
4 wks initial introduction of anaerobic
  Power&flexibility, Hill training
4 wks Anaerobic training - intervals or reps
4 wks Coordination-coordination aerobic/anaerobic (Time trials)
Maximum speed development (sprint drills)
Maintain anaerobic capacity (sharpeners)
1-2wks Freshen up

Don’t really do this much here?

similar
To pool Training!
How does it fit into what you do in the pool?
Open Water Training

Thomas Lurtz
Silver Medal London 10K
Recent interview 1vigor.com

1Vigor: What ratio of pool to open water swim training do you recommend?

Thomas Lurtz: I only train in the pool and never outdoors in the sea because you can't train race situations. Race conditions are always different and there are many competitors.

You also need to swim fast the Last 2 km in an Open water Race. I am sure it's around 1:02 average each 100m or even faster for the last 2 km. This speed you only can train and prepare in the Pool. Experience you should collect in the races.
Training in pool at VO2 max or threshold is probably best for improving economy.

However, training in OW may help develop stroke economy in waves and rough water not encountered in pools.
The effect of training on aerobic power characteristics of young cross-country skiers.

Rusko H.
Department of Biology of Physical Activity, University of Jyväskylä, Finland.

Abstract
The influences of growth, training and various training methods were investigated by analysing long-term training effects in young cross-country and biathlon skiers (n = 129). Some athletes (n = 49) were studied six times in three years and some at least once a year during a four year period (n = 48). During three summer training periods skiers emphasized either intensive training or distance training or continued to train normally. The results indicated that maximal oxygen uptake (VO2 max) and heart volume increased between 15 and 20 years of age and the most significant changes in heart volume were observed between 16 and 18 years of age. International level skiers were able to increase their VO2 max and heart volume even after 20 years of age. Anaerobic threshold (AT, ml kg-1 min-1) increased like VO2 max but when expressed as a percentage of VO2 max, the AT was similar in every age group over 16 years of age. Intensive training at the intensity of anaerobic threshold or higher was observed to be most effective in producing improvements in VO2 max. Low-intensity distance training was more effective in producing improvements in anaerobic threshold.
Open Water Specific Training - Outdoors

Transportation
- Swimmers
- Boat

Conditions
- Water Quality
- Temperature
- Weather

<table>
<thead>
<tr>
<th>Month</th>
<th>°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>April*</td>
<td>58</td>
</tr>
<tr>
<td>May*</td>
<td>64</td>
</tr>
<tr>
<td>June</td>
<td>65</td>
</tr>
<tr>
<td>July</td>
<td>72-80</td>
</tr>
<tr>
<td>Aug</td>
<td>76-70</td>
</tr>
<tr>
<td>Sept</td>
<td>67-65</td>
</tr>
</tbody>
</table>

Seasonal Lake Temp in NH
What Kind of Sets?

Low Intensity Training

- 4-6 x1200m (To slide and back)

Low intensity with interval work

- 5K continuous swim around perimeter
- 1200 swim
- 10 x 200m around buoys
- 1200 cool down
GPS for OW

Activity: swimming
Distance: 3948.3m
Duration: 1h 10m 30s
Started: 19 Apr 12:59
Finished: 19 Apr 14:09
Speed: 3.35 km/h
Pace: 107.53s/100m

View details...
**Safety**

**INANIMATE**
- submerged trees, rocks
- currents, temperature
- marine traffic

**ANIMATE**
- Sea Lions, Dolphins, Manatees, Beavers
- Sharks
- Alligators, Snakes
- Jellyfish, Sea lice
- Naegleria (brain), Giardia (intestine),
- Blue-Green Algae (Liver)
- Bacteria (Weill’s disease)
Water Quality

[Images of different water-related activities and signs indicating water quality warnings]
Other OW Specific Options

- Tethered Swimming
- Pool Open Water
- Vasa Ergometer / Vasa Trainer
Tethered Swimming

52 °F

103°F
Pool Open Water

Advantages:
- Controlled Environment
- Good Endurance work
- Safe

Disadvantages:
- Controlled Environment
- Takes up space
- Not always safe--collisions
- --sore shoulders
Practice Feeding

- Feeding dock is a busy place
- Can Practice feeding in pool

(video)
Vasa Trainer

Repeats of short sets
• Build strength
• Change resistance
• Focus on Technique

(video)
Long swims
Or short intense swims

Vasa Ergometer

(video)
Coming Soon!

Real time power output
Power Balance L/R arms

Vasa ANT+
Strava power app
Credits

- Gerry Rodrigues  Tower 26
- Don Lemieux  Greenwood Swimming
- Tim Murphy  Harvard University
- Stan Corcoran  McCallie School
- Brian Brown  FAST
- Lori Briggs  Core Body Solutions LLC
- Mike Doanne  USA Triathlon
- Jack Roach  USA Swimming
- James Ramirez  FINIS
- Rob Sleamaker  VASA
- Paul Asmuth  USA Swimming
- Jon Urbanchek  USC
- Dick Shoulberg  Germantown Academy
- Mike Westphal  Indiana University
- Chris Woolridge  Exeter Swim Team
- Robert Strauss  Miami 10K
- Frank Flowers  Flowers Sea Swim
- Sid Cassidy  St. Andrews School
- Morty Berger  NYC Swim
- Steve Munatones  OW Source
“A great coach is the result of a coach and a great athlete getting along well”

Jack Daniels Ph.D.
Running Coach

The End

Eva Fabian, Yale ‘16