Dr Karl Cooke

Optimising Performance in Tennis
National Tennis Centre

• Home of British Tennis

• Training & preparation base for most elite tennis players in UK

• Players based at the NTC receive Coaching, Sports Science & Sports Medicine Support on site

• Players are from a broad range of ages including juniors (15+) and senior professionals

• Extensive facilities: courts, gym, track, treatment rooms, altitude training
Firstbeat at the NTC

Firstbeat Fitness Coach

Firstbeat SPORTS
- Trainer tool for deeper analysis, overtraining assessment, more detailed group reporting, etc.

Firstbeat Uploader
- Players upload the measured data – any time, anywhere

Firstbeat Monitor
- Monitor the game – any time, anywhere
- The measured data is stored to the server

Trainer tools
- Access the players’ data – any time, anywhere
- Observe, give feedback, provide training program

LTA BRITISH TENNIS
The Nature of Elite Tennis

• Some of the challenges:
  
  • Highly nomadic global sport
  
  • High number of competition (25+) weeks
  
  • De-conditioning during competition blocks
  
  • 12-15 physical training / development weeks
  
  • Multifaceted athlete development
Movement Demands
6 x 10 x 3 of 32 m sprints (0-30 km/h) ∑ 5.8 km
Physiological Demands

30 x 105 s of 70-80 % VO2 max

9.7 ± 1.0 kcal/kg/hour
80 kg male 3 hour match = 2328 kcal
≈ 300 g of CHO
In Match Nutrition

THE LONGEST MATCH

WAS PLAYED ON NO. 18 COURT
22nd - 24th JUNE 2010

JOHN ISNER (USA) BEAT NICOLAS MAHUT (FRA)
6-4 3-6 6-7(7-9) 7-6(7-3) 70-68

MATCH DURATION
11 HOURS 5 MINUTES
What is the role of Monitoring?

I. In **British Tennis** Overtraining, UUPS, Chronic Fatigue are rare

II. Time lost due to Illness & Overuse Injuries is more frequent

III. Travel, jet lag and sleep debt are real risks to performance

IV. Goal is identify antecedents of Injury, Illness & Optimal Adaptation
Training Load in Tennis
# Training Load in Tennis

<table>
<thead>
<tr>
<th>Intensity</th>
<th>Weighting</th>
<th>Player 1 Time (min)</th>
<th>Player 2 Time (min)</th>
<th>Player 3 Time (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximal</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>V Hard</td>
<td>4.5</td>
<td>21</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Hard</td>
<td>2.2</td>
<td>26</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>Moderate</td>
<td>1.5</td>
<td>23</td>
<td>38</td>
<td>24</td>
</tr>
<tr>
<td>Easy</td>
<td>1</td>
<td>18</td>
<td>32</td>
<td>28</td>
</tr>
</tbody>
</table>

**Training Load**  
(Weight x Time)  
204  
107  
99
Training & Recovery Balance

A few practical examples of how training and recovery test reports have been used:

1. Recovery from glandular fever
2. Individualising jet lag protocols
3. Recovery profile in team competition
Recovery – Glandular Fever

Date: 23/02/2009
Background information
Age: 22
Height (cm): 190
Weight (kg): 71
TRIMP: 290

Date: 02/11/2009
Background information
Age: 22
Height (cm): 190
Weight (kg): 71
TRIMP: 60

Return to light training
Recovery – Glandular Fever

Return to intense training

Individualising Jet Lag protocols

- 60% of max recovery index
- 75% of max recovery index
- 100% of max recovery index
Recovery profile in team competition

Stress and recovery chart

Duration Proportion
Stress 26 min 8 %
Recovery 3h 49min 69 %

Stress
Increased level of physiological activation that may be caused by intensive physical training or other life stressors.
Recovery
Decreased level of physiological activation that may be caused by the absence of intensive physical training and absence of other stressors.

Recovery Index and Follow Up
Recovery Index: 175
42% of the maximum recovery value in record
Optimising Adaptations for Tennis
Questions?

If you think of questions later:

Karl.cooke@lta.org.uk