The fastest players at the 30m sprinting test showed the fastest as well in all other distances and this may be advantage when performing short distances during the game.

**Key words:** Soccer. Sprint test. Sports performance.

### Control of the tennis stroke and metabolic responses through a new specific tennis field test

**Caballero P1, Domínguez G1, De Teresa C2, Feriche B1**

1Facultad de Ciencias del Deporte, Universidad de Granada P; 2”Alfonso X El Sabio” University (Madrid, Spain); 3Universidad Politécnica (Madrid, Spain)

The endurance and success of stroke are some of the key point factors of tennis performance. There is a lack of specific field tennis tests to prescribe and control training performance; therefore it is necessary to investigate on new field test that allows relating the physiological parameters to the technical.

**Aim:** The aim of this preliminary study was to apply a new specific tennis field test to know the relationship between the workload in metabolic zones and success or efficiency of stroke (ES) and determine a model of response.

**Methods:** The study was realized by 5 tennis players (age 23 ± 1.9 years; height 174.9 ± 5.7 cm; weight 68.1 ± 5.7 kg; training per week 8.2 ± 2 hours). All subjects performed two incremental protocols to exhaustion: laboratory test (treadmill test) and a tennis specific field test. The field test consisted of repeated strokes (forehand and backhand) during 1 min, with 20 sec of rest. In both tests, heart rate (HR) and rating of perceived exertion (RPE) was monitored; the ventilatory thresholds were determined in the laboratory test.

**Results:** The relationship between the metabolic zones by workload and ES was shown by figure 1. Three types of response were identified:

- **Type 1 mixed:** better ES in mixed zone (between VT1 and VT2).
- **Type 2 aerobic:** better ES in aerobic zone (before VT1), maintain a regular response in mixed zone (between VT1 and VT2) and decrease near anaerobic threshold (VT2).
- **Type 3 anaerobic:** better ES in anaerobic zone (before VT1), maintain a regular response in mixed zone (between VT1 and VT2) and decrease near anaerobic threshold (VT2).

**Conclusions:** The new protocol described provides a suitable tool to assess tennis performance; therefore it is necessary to investigate on new field test that allows relating the physiological parameters to the technical.

**Key words:** Field test. Tennis performance. Success of stroke.

### Balance and postural control assess in elite ice skaters

**López-Illscas A1, Hernández Martín I1, López Román A2, Caraça Valente JP3**

1High Sports Council (Spain); 2“Alfonso X El Sabio” University (Madrid, Spain); 3Universidad Politécnica (Madrid, Spain)

Regardign biomechanics, ice skating requires dynamic and static postural control of neuromuscular balance and coordination features as well as skills which are far more important than those essential for other sports or everyday life activities. Especially within elite ice skating, mainly in technical gestures such as “take off” and “landing” of jumps.

The Neurocom Balance Master device provides basic technology to assess such features.

**Objectives:**

- Determine whether Neurocom Balance Master allows to assess and discriminate balance, coordination and postural control skills within ice skating.
- Determine which parameters are more suitable and discriminative to assess ice skaters’ balance and coordination.
- Obtain data to increase the normative database within Spanish elite sportmen and provide knowledge to improve training systems and performance.

**Materials and methods:**

**Subjects:** 45 healthy elite ice skaters, 20 men and 20 women (age range, 12 – 17 years).

Control Group: 60 students (who didn’t practice any sport, age range, 15 – 20 years).

**Instruments:** Neurocom Balance Master Posturographer.

**Protocol:** 1. Specific warm up; 2. Three repetitions of each of the following tests (Table 1); 3. Description of variables. The “t of Student” was used to analyse independent samples. (Statistics pack SPSS. 15.00)

**Results and conclusions:**

1. Posturography assess using Neurocom Balance Master allows a suitable discrimination of balance and coordination features in elite ice skaters.
2. The most discriminative parameter was the sway of Centre of Gravity (COG)’s shift in the test CTSIB (modified), when the sportman is on a foam surface with closed eyes.
3. Several parameters showed a significative difference if compared to the control group.
4. Men data regarding RWS test were higher than such data in women, showing a better velocity of reaction.

Data will be shown within graphics and tables.

In this trial, the results belong to data obtained along the development of the project: “ViP: Intelligent System for Isokinetic and Posturographical Analyzing, Integration and Assess of the Spine” Financed by the Ministry of Science and Innovation. Research Head Office Science and Technology I + D. Projects: africa.lopez@csd.mec.es


### TRAINING AND PERFORMANCE IMPROVEMENT-IV

**Assess of isokinetic trunk strength in elite basketball players

López-Illescas A1,2, Pérez Toledano JJ1, De Campos Gutiérrez de Calderón A1, Caraça Valente JP1**

1High Sports Council (Spain); 2“Alfonso X El Sabio” University (Madrid, Spain); 3Universidad Politécnica (Madrid, Spain)

<table>
<thead>
<tr>
<th>TESTS</th>
<th>PARAMETERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Test of Sensory Interaction on Balance (modified CTSIB)</td>
<td>Mean Center of Gravity Sway Velocity</td>
</tr>
<tr>
<td>Limits of Stability (LOS)</td>
<td>Reaction Time</td>
</tr>
<tr>
<td>Rhythmic Weight Shift</td>
<td>Movement Velocity</td>
</tr>
<tr>
<td>Step/Quick Turn</td>
<td>Endpoint excursion</td>
</tr>
<tr>
<td>Step Up/Over</td>
<td>Maximum Excursion</td>
</tr>
<tr>
<td>Forward Lunge</td>
<td>Directional Control</td>
</tr>
</tbody>
</table>

**Table 1. López-Illescas A, et al.**

<table>
<thead>
<tr>
<th>Groups</th>
<th>10m</th>
<th>20m</th>
<th>30m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q2</td>
<td>0.39</td>
<td>0.65</td>
<td>0.95</td>
</tr>
<tr>
<td>Q3</td>
<td>0.71</td>
<td>1.18</td>
<td>1.56</td>
</tr>
<tr>
<td>Q4</td>
<td>1.10</td>
<td>1.87</td>
<td>2.57</td>
</tr>
</tbody>
</table>

**Table 2. Aguilo A, et al. Mean distances (m) of the athletes of the Q1 compared to the athletes of the other groups.**

- **Groups:** Q1, Q2, Q3, Q4.
- **Distances:** 10m, 20m, 30m.
- **Mean Values:**
  - Q2: 0.39, 0.65, 0.95
  - Q3: 0.71, 1.18, 1.56
  - Q4: 1.10, 1.87, 2.57

**Conclusions:** The specific parameters of the CTSIB (modified) provide a suitable tool to assess balance, coordination and postural control skills within ice skating.