



PHYSICAL TESTING PROTOCOL

BOXING CANADA

Document prepared by

Pierre-Mary Toussaint, B.Sc., M.Sc., Kinesiologist

Strength and conditioning coach, Boxing Canada

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This document is intended as a guide to the physical testing used by Boxing Canada to measure and evaluate the boxing-specific skills and athletic abilities of national team members. The protocol was designed and finalized in October 2018 by the strength and conditioning coach, program director and coaches, along with the physiologist and biomechanist at the National Training Centre at the Institut National du Sport du Québec.

1. BODY DIMENSIONS AND COMPOSITION

- **WHAT IS MEASURED:** Athlete weight and height. Body fat percentage by bioelectrical impedance analysis.
- **GOAL:** Determine the athlete's weight and percentage of fat and lean body mass to guide a weight gain or loss regimen to make their weight class. It can help an athlete from straying too far from their weight class or safely guide them into another weight class.





2. MAXIMUM GRIP STRENGTH

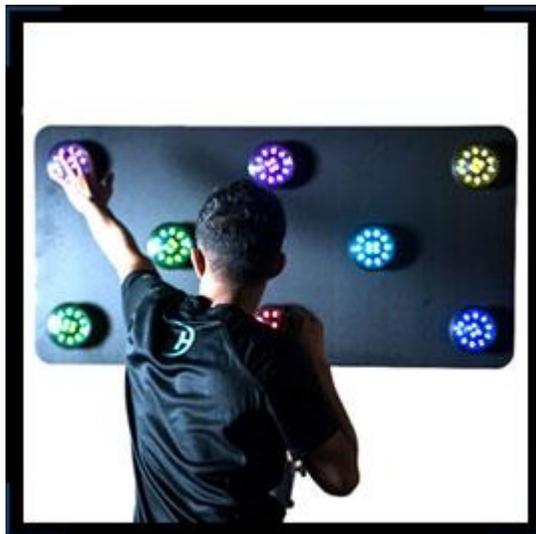
- **WHAT IS MEASURED:** Maximum force produced by the forearm flexor muscles using a manual dynamometer.
- **GOAL:** Determine the contraction force of the muscles that stiffen the wrist and fingers and thereby contribute to the impact force of a punch.





3. REACTION TIME AND SPECIFIC MOVEMENT TIME

- **WHAT IS MEASURED:** Reaction time and specific movement time in response to visual signals from the Fitlight training device.
- **GOAL:** Measure the reaction time to visual signals with boxing-specific movements directed at the lit targets. Determine the average reaction time and number of successful attempts in 60 seconds.





4. PEAK POWER WITH ARM CRANK ERGOMETER (WINGATE)

- **WHAT IS MEASURED:** Upper-body peak and average power developed over 30 seconds using an arm crank ergometer, and fatigue percentage (power lost) over the time of the test.
- **GOAL:** Measure the peak and average power the athlete can develop with the upper limbs over 30 seconds and their ability to limit loss of power over that period. This is an essential ability in amateur boxing, particularly at the start and end of each round.

5. REPEATED EFFORT TEST WITH ARM CRANK ERGOMETER

- **WHAT IS MEASURED:** Upper-body power developed with an arm crank ergometer using a protocol of 5 seconds of maximum effort followed by 10 seconds of rest repeated over a 3-minute round. The fatigue percentage (power lost) over this period is also measured.
- **GOAL:** Measure the athlete's capacity to produce repeated constant-power efforts with the upper limbs in a 3-minute round.





6. PEAK POWER TEST WITH WEIGHT

- **CE QUI EST MESURÉ:** la puissance maximale développée lors d'un geste unique de «press» couché avec haltère, mesuré par un encodeur linéaire.
- **OBJECTIF:** Mesurer la puissance maximale développée dans un geste unique de «press» avec différentes charges pour ainsi déterminer une courbe force-puissance pour chaque athlète.





7. PEAK POWER OF LOWER LIMBS

- **WHAT IS MEASURED:** Lower limb peak power over a vertical jump, as measured with the Opto-Jump device.
- **GOAL:** Measure the peak power developed by the lower limbs when doing a jump squat.





8. REACTION TIME AND FEET MOVEMENT TIME

- **WHAT IS MEASURED:** Reaction time and feet movement time in response to a visual signal, as measured by the Opto-jump device.
- **GOAL:** measure the reaction time and feet movement time towards a target in response to a visual signal. This skill is very specific in Boxing.

