

Quantifying Game Demands of Open Age and Under 21 Male State Hockey Players

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Background: The present study was the first to examine notational analysis (movement and game-specific events) in elite men's hockey. Advanced technology in sports science such as the use of GPS, provide objective feedback for coaches and conditioning staff and players, but advanced technologies are commonly not accessible to participants in the sport of hockey. **Purpose:** To use GPS tracking devices and computerized notational analysis to compare movement demands and game-specific events of six competitive games in senior state and under 21 men's hockey. The results were intended to quantify the gap between the two levels of competition and provide substantial information for coaches, conditioning staff and players. **Methods:** Using an observational study, 17 male players from the open age ($n = 10$; 23.44 ± 1.56 years; 180.38 ± 5.34 cm; 79.79 ± 4.53 kg; $VO_{2max} = 62.10 \pm 2.57$ ml·kg⁻¹·min⁻¹) and under 21 ($n = 7$; 19.55 ± 1.51 years; 181.64 ± 7.91 cm; 78.03 ± 8.42 kg; $VO_{2max} = 59.83 \pm 2.96$ mL·kg⁻¹·min⁻¹) New South Wales hockey squads participated in six pre-season games. Testing involved field and laboratory tests. Field based testing involved GPS SPI 10 tracking devices, worn by six different players (two midfield, two strikers, two defenders) over six competitive games (pre-season). Video-recording and coding (SportsCode) of individual performance of players wearing the devices were also conducted to record game-specific, or other notational events (hit, tackle, push, overhead, and trap). Accredited hockey coaches also assessed the effectiveness of events. Laboratory testing was used to determine cardiorespiratory fitness (VO_{2max}), and maximum speed (10 m, 20 m and 40 m sprints). Data were gathered via baseline surveys to establish training history and training loads. **Results:** Results from the use of GPS devices on players revealed no differences in physiological demands between open age and under 21 players ($p < 0.05$). This included total distance, number of sprints, total sprint time per game, average sprint duration, and average and peak heart rate (HR). Additionally, no differences were found in sprints per minute of game time. No differences were found among the three positions (striker, midfield and defender) and the above mentioned GPS variables ($p < 0.05$). Data gained by SportsCode confirmed several differences in all game specific events measured and position ($p > 0.05$). **Summary:** The present study reaffirms claims by previous research that the physiological requirements of hockey are immense. Similarities exist between the two age groups, suggesting the game demands are analogous. It is thought skill level and high speed decision making ability of players are key areas for the future differentiation between under 21 and open age players.