

# EFFECTS OF HIGH-INTENSITY TRAINING WITH ONE VERSUS THREE CHANGES OF DIRECTION ON YOUTH FEMALE BASKETBALL PLAYERS' PERFORMANCE

Javier Sanchez-Sanchez<sup>1,2</sup>, Manuel Carretero<sup>1,2</sup>, Rodrigo Ramirez-Campillo<sup>2,3</sup>,  
Cristina Petisco<sup>1,2</sup>, María Diego<sup>1</sup>, Oliver Gonzalo-Skok<sup>2,4</sup>, and Fábio Y. Nakamura<sup>2,5,6</sup>

<sup>1</sup>*Pontifical University of Salamanca, Salamanca, Spain*

<sup>2</sup>*Research Group Planning and Assessment of Training and Athletic Performance,  
Pontifical University of Salamanca, Salamanca, Spain*

<sup>3</sup>*Department of Physical Activity Sciences, Research Nucleus in Health,  
Physical Activity and Sport, Universidad de Los Lagos, Osorno, Chile*

<sup>4</sup>*San Jorge University, Zaragoza, Spain*

<sup>5</sup>*The College of Healthcare Sciences, James Cook University, Queensland, Australia*

<sup>6</sup>*Department of Medicine and Aging Sciences, "G. d'Annunzio" University of Chieti-Pescara*

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## Abstract:

To compare the effects of high-intensity interval training (HIT) with one versus three changes of direction (COD) on young (age, 17.2±1.1 years) female basketball players' performance, six weeks of regular basketball training (control period) was followed by six weeks of high-intensity training added to regular training, two times per week, with a random allocation of athletes to either HIT with one (HIT-COD1; n=6) or three COD (HIT-COD3; n=6). Before and after the control and HIT-COD training periods athletes performed repeated-sprint ability test (RSA), modified agility T-test (MAT), V-cut, triple standing dominant (TS-D) and non-dominant (TS-ND) jump, TS-D and TS-ND with COD tests, and 30-15 Intermittent Fitness Test (30-15<sub>IFT</sub>). With the exception of a substantial improvement in V-cut in both groups, no substantial changes occurred during the control period. Both HIT-COD training programs improved V-cut, although only HIT-COD3 substantially improved RSA mean time (RSA<sub>m</sub>), MAT and the final speed reached in 30-15<sub>IFT</sub> (V<sub>IFT</sub>). The between-group comparison revealed greater improvements in RSA<sub>m</sub> and V<sub>IFT</sub> in HIT-COD3 than in HIT-COD1. In conclusion, supplementation of basketball training with HIT-COD drills adds improvements to young female basketball player's performance, especially when 3 COD are incorporated into HIT.

**Key words:** team sport, agility, fitness, women, maturation, explosive strength

## Introduction

Optimization of strength and conditioning for basketball requires the consideration of a range of physical and physiological traits relevant to competition (Torres-Ronda, Ric, Llabres-Torres, de Las Heras, & Schelling, 2016). Basketball is an intermittent sport, in which high-intensity neuromuscular efforts alternate with brief partial-recovery rest periods (Ben Abdelkrim, El Fazaa, & El Ati, 2007). Performance of high-intensity actions such as jumping, accelerating, decelerating, sprinting with change of direction (COD) (Marcelino, et al., 2016) and the ability to repeat these actions during competition are key to success (Torres-Ronda, et al., 2016). To this aim athletes should strive to develop

optimally their sport performance (Marcelino, et al., 2016), targeting adequate levels of aerobic and anaerobic power, strength, and agility (Schelling & Torres-Ronda, 2013).

High-intensity interval training (HIT) has been advocated as a sport-specific conditioning strategy for team-sport athletes due to its mimicking the specific demands of competition (Stone & Kilding, 2009), alternating between periods of high-intensity and low-intensity effort (Laursen & Jenkins, 2002). This pattern of neuromuscular recruitment activates both the aerobic and anaerobic metabolism (Buchheit & Laursen, 2013b). Moreover, HIT allows the accumulation of substantial volumes of intense training with reduced fatigue-related effects (e.g.,