



This is a peer-reviewed, post-print (final draft post-refereeing) version of the following published document and is licensed under All Rights Reserved license:

**Ayala, Francisco ORCID logoORCID: <https://orcid.org/0000-0003-2210-7389>, López-Valenciano, Alejandro, Jose, Antonio, De Ste Croix, Mark B ORCID logoORCID: <https://orcid.org/0000-0001-9911-4355>, Vera-García, Francisco, García-Vaquero, Maria, Ruiz-Pérez, Iñaki and Myer, Gregory (2019) A preventive model for hamstring injuries in professional soccer: Learning algorithms. *International Journal of Sports Medicine*, 40 (5). pp. 344-353. doi:10.1055/a-0826-1955**

Official URL: <https://doi.org/10.1055/a-0826-1955>

DOI: <http://dx.doi.org/10.1055/a-0826-1955>

EPrint URI: <https://eprints.glos.ac.uk/id/eprint/6383>

#### **Disclaimer**

The University of Gloucestershire has obtained warranties from all depositors as to their title in the material deposited and as to their right to deposit such material.

The University of Gloucestershire makes no representation or warranties of commercial utility, title, or fitness for a particular purpose or any other warranty, express or implied in respect of any material deposited.

The University of Gloucestershire makes no representation that the use of the materials will not infringe any patent, copyright, trademark or other property or proprietary rights.

The University of Gloucestershire accepts no liability for any infringement of intellectual property rights in any material deposited but will remove such material from public view pending investigation in the event of an allegation of any such infringement.

PLEASE SCROLL DOWN FOR TEXT.

**SDC5:** Description of the lower extremity joints (hip, knee and ankle) range of motion assessment tests and measures obtained from them.

#### Lower extremity joints range of motion assessment tests

The passive hip flexion with knee flexed and extended, extension, abduction, external and internal rotation; knee flexion; and ankle dorsiflexion with knee flexed and extended ROMs of the dominant and non-dominant legs were assessed following the methodology previously described [1]. Furthermore, for each joint ROM measure, side-to-side differences were also calculated. In this sense, when side-to-side difference  $> 6^\circ$  was found, players were categorised as showing bilateral asymmetries whereas scores  $\leq 6^\circ$  were accepted as normal (non-bilateral asymmetries) [2].

Measures obtained from the lower extremity range of motion assessment tests.

Name	Labels	
	Dominant Leg	Non-Dominant Leg
ROM-PHF <sub>KF</sub>	<144.5, 144.5-151.5 or	<144.5, 144.5-152.5 or
	>151.5	>152.5
ROM-PHF <sub>KE</sub>	<77.5, 77.5-82.9 or	<78.5, 78.5-84.5 or
	>82.9	>84.5
ROM-PHE	<7.5, 7.5-12.5 or >12.5	<9.25, 9.25-13.5 or
		>13.5
ROM-PHABD	<61.5, 61.5-68.5 or	<58.5, 58.5-66.5 or
	>68.5	>66.5
ROM-PHIR	<44.5, 44.5-50.5 or	<42.5, 42.5-48.5 or
	>50.5	>48.5

ROM-PHER	<47.5, 47.5-52.5 or >52.5	<46.5, 46.5-55.5 or >55.5
ROM-PKF	<121.5, 121.5-132 or >132	<120.5, 120.5-130.5 or >130.5
ROM-PAKDF <sub>KE</sub>	<34.25, 34.25-39.5 or >39.5	<35.25, 35.25-38.5 or >38.5
ROM-PAKDF <sub>KF</sub>	<35.5, 35.5-40.5 or >40.5	<36.75, 36.75-39.75 or >39.75
BilaRatio- ROM-PHF <sub>KF</sub>	No Asymmetry ( $\leq 6^\circ$ ) or Asymmetry ( $>6^\circ$ )	
BilaRatio- ROM-PHF <sub>KE</sub>	No Asymmetry ( $\leq 6^\circ$ ) or Asymmetry ( $>6^\circ$ )	
BilaRatio- ROM-PHE	No Asymmetry ( $\leq 6^\circ$ ) or Asymmetry ( $>6^\circ$ )	
BilaRatio- ROM-ABD	No Asymmetry ( $\leq 6^\circ$ ) or Asymmetry ( $>6^\circ$ )	
BilaRatio- ROM-PHIR	No Asymmetry ( $\leq 6^\circ$ ) or Asymmetry ( $>6^\circ$ )	
BilaRatio- ROM-PHER	No Asymmetry ( $\leq 6^\circ$ ) or Asymmetry ( $>6^\circ$ )	
BilaRatio- ROM-PKF	No Asymmetry ( $\leq 6^\circ$ ) or Asymmetry ( $>6^\circ$ )	
BilaRatio- ROM-AKDF <sub>KE</sub>	No Asymmetry ( $\leq 6^\circ$ ) or Asymmetry ( $>6^\circ$ )	
BilaRatio- ROM-AKDF <sub>KF</sub>	No Asymmetry ( $\leq 6^\circ$ ) or Asymmetry ( $>6^\circ$ )	

---

PROM: passive range of motion; HF<sub>KF</sub>: hip flexion with the knee flexed; HF<sub>KE</sub>: hip flexion with the knee extended; HE: Hip extension; HABD: hip abduction at 90° of hip flexion; HIR: hip internal rotation; HER: hip external rotation; KF: knee flexion; AKDF<sub>KE</sub>: ankle dorsi-flexion with the knee extended; AKDF<sub>KF</sub>: ankle dorsi-flexion with the knee flexed; Bila: bilateral.

## References

1. Cejudo A, Sainz de Baranda P, Ayala F, Santonja F. Normative data of lower-limb muscle flexibility in futsal players. *Rev Int Med Cienc Act Fis Deporte* 2014;14:509-525.
2. Fousekis K, Tsepis E, Poulmedis P, Athanasopoulos S, Vagenas G. Intrinsic risk factors of non-contact quadriceps and hamstring strains in soccer: a prospective study of 100 professional players. *Br J Sports Med* 2011;45:709-714.