

## Federation University ResearchOnline

<https://researchonline.federation.edu.au>

Copyright Notice

This is the published version of:

Reiman, Agricola, R., Kemp, J. L., Heerey, J. J., Weir, A., van Klij, P., Kassarjian, A., Mosler, A. B., Ageberg, E., Hölmich, P., Warholm, K. M., Griffin, D., Mayes, S., Khan, K. M., Crossley, K. M., Bizzini, M., Bloom, N., Casartelli, N. C., Diamond, L. E., ... Dijkstra, H. P. (2021). Infographic. Consensus recommendations on the classification, definition and diagnostic criteria of hip-related pain in young and middle-aged active adults from the International Hip-related Pain Research Network, Zurich 2018. *British Journal of Sports Medicine*, 55(2), 115–117.

Available online: <https://doi.org/10.1136/bjsports-2020-102219>

Copyright © Author(s) (or their employer(s)) 2020. This is an Open Access article distributed under the terms of the Creative Commons Attribution-Non Commercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is cited and the use is non-commercial. Commercial use is not permitted.

See this record in Federation ResearchOnline at:

<http://researchonline.federation.edu.au/vital/access/HandleResolver/1959.17/184623>

# Infographic. Consensus recommendations on the classification, definition and diagnostic criteria of hip-related pain in young and middle-aged active adults from the International Hip-related Pain Research Network, Zurich 2018


Michael P Reiman <sup>1</sup>, Rintje Agricola <sup>2</sup>, Joanne L Kemp <sup>3</sup>, Joshua J Heerey <sup>3</sup>, Adam Weir <sup>4,5</sup>, Pim van Klij <sup>6</sup>, Ara Kassarian <sup>7,8</sup>, Andrea B Mosler <sup>3</sup>, Eva Ageberg <sup>9</sup>, Per Hölmich <sup>10</sup>, Kristian Marstrand Warholm <sup>11</sup>, Damian Griffin <sup>12,13</sup>, Sue Mayes <sup>3</sup>, Karim M Khan <sup>14</sup>, Kay M Crossley <sup>3</sup>, Mario Bizzini <sup>15</sup>, Nancy Bloom <sup>16</sup>, Nicola C Casartelli <sup>17,18</sup>, Laura E Diamond <sup>19,20</sup>, Stephanie Di Stasi <sup>21</sup>, Michael Drew <sup>22,23</sup>, Daniel J Friedman <sup>24</sup>, Matthew Freke <sup>25</sup>, Sion Glyn-Jones <sup>26</sup>, Boris Gojanovic <sup>27,28</sup>, Marcie Harris-Hayes <sup>16</sup>, Michael A Hunt <sup>29</sup>, Franco M Impellizzeri <sup>30</sup>, Lasse Ishøi <sup>31</sup>, Denise M Jones <sup>3</sup>, Matthew G King <sup>32</sup>, Peter R Lawrenson <sup>33</sup>, Michael Leunig <sup>34</sup>, Cara L Lewis <sup>35</sup>, Nicolas Mathieu <sup>36</sup>, Håvard Moksnes <sup>37</sup>, May Arna Risberg <sup>38,39</sup>, Mark J Scholes <sup>40</sup>, Adam I Semciw <sup>3</sup>, Andreas Serner <sup>41</sup>, Kristian Thorborg <sup>10</sup>, Adam Virgile <sup>42</sup>, Tobias Wörner <sup>9</sup>, H Paul Dijkstra <sup>43,44</sup>

Young and middle-aged active adults with hip and groin pain often present with a confusing overlap of signs and symptoms. There is no consensus on how to define or classify hip disease with different and overlapping intra-articular and extra-articular contributors to symptoms in an anatomically complex region. Several researchers and consensus groups have previously

attempted to define aspects of hip and groin pain.<sup>1-4</sup> In 2017, the International Hip Pain Research Network (IHiPRN) was established to facilitate collaboration across research groups and disciplines and to improve knowledge dissemination of hip-related pain to clinicians. In this paper,<sup>5</sup> published in the *British Journal of Sports Medicine*, we first describe the


general consensus process applied to all topics in this series. We then make recommendations on the first topic on how to classify, define and diagnose hip disease in young and middle-aged active adults, with hip-related pain as the main symptom. Other papers in this series used this classification of hip-related pain in the assessment of (1) patient-reported outcome

Br J Sports Med: first published as 10.1136/bjsports-2020-102219 on 31 August 2020. Downloaded from http://bjsm.bmj.com/ on September 8, 2020 at University of Technology Sydney. Protected by copyright.



Reference: Reiman et al., 2020. BJSM


## Consensus Recommendations on the Classification, Definition and Diagnostic Criteria of Hip-related Pain in Young and Middle-aged Active Adults (Zurich, 2018)

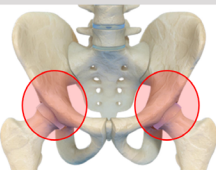


Created by: @AdamVirgile

### Summary of Final Consensus Recommendations

Recommendation Level





#### Expert Backgrounds

The 38 experts included:

- ✓ Physiotherapists
- ✓ Orthopaedic surgeons
- ✓ Sports and exercise medicine physicians and scientists
- ✓ Biomechanists
- ✓ Radiologists

#### Research Driven

Evidence summaries from literature searches and syntheses of included articles were the basis of the Zurich consensus meeting discussions. These informed the consensus recommendations for clinicians and researchers.



#### Reaching Agreement


The group discussed, revised and then voted on the appropriateness of the recommendations using a 10-point Likert scale.

#### For Clinicians


% of experts who voted 'appropriate'

- 1 A negative flexion adduction internal rotation (FADIR) test helps to rule out hip disease.
 







97%
- 2 Diagnostic utility of imaging for hip disease in people with hip-related pain is limited; imaging should always be combined with the patient's symptoms and clinical signs.
 



94%
- 3 Anteroposterior (AP) pelvis and lateral femoral head-neck radiographs should be requested to assist diagnosing hip-conditions associated with hip-related pain.
 



100%


Cross-sectional imaging is recommended when further morphological assessment or evaluation of intra-articular structures is indicated.

#### For Clinicians & Researchers

% of experts who voted 'appropriate'

After imaging, hip-related pain may be further categorized into:

1. Femoroacetabular impingement (FAI) syndrome.
2. Acetabular dysplasia and/or hip instability.
3. Other conditions causing hip-related pain, including soft-tissue conditions (labrum, cartilage, and ligamentum teres) without a specific bony morphology.



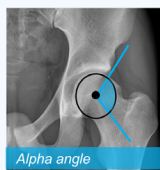
89%


#### For Researchers

% of experts who voted 'appropriate'


- 1 Bony morphology outcome measures (e.g. alpha angle or centre-edge angle) should be clearly defined, measured and reported.
 

An example of an alpha angle measurement on an anteroposterior (AP) pelvis radiograph.





97%
- 2 Future research should include large-scale, interdisciplinary research on aetiology and prognosis for FAI syndrome, acetabular dysplasia, and other conditions causing hip-related pain.
 



97%

BMJ

Reiman MP, et al. Br J Sports Med Month 2020 Vol 0 No 0



1

measures,<sup>6</sup> (2) standardised measurement of physical capacity<sup>7</sup> and (3) physiotherapist-led treatment.<sup>8</sup>

For this paper, the working group used a scoping review framework to search the literature for systematic reviews, intervention and observational studies (prospective or retrospective) with a study population of at least 10 young and middle-aged active adults and published in English language, peer-reviewed journals. Evidence summaries and consensus recommendations were then presented to and discussed by the whole group of IHiPRN participants. We reached consensus on three clinical recommendations, one clinical and research recommendation, and two research recommendations (infographic), all of which were an amalgamation of best available evidence and expert opinion. Following discussion, each participant was asked to perform a blinded vote on the recommendation (infographic). Both non-musculoskeletal and serious hip pathology conditions (eg, tumours, infections, slipped capital femoral epiphysis), as well as competing musculoskeletal conditions (eg, lumbar spine) should first be excluded before categorising hip disease in young and middle-aged active adults presenting with hip-related pain. Once these are excluded, hip-related pain should be categorised into (1) femoroacetabular impingement syndrome, (2) acetabular dysplasia and/or hip instability and (3) other conditions without bony morphology causing hip-related pain, such as chondral, labral and ligamentum teres conditions.

The diagnostic clinical utility for the various clinical and radiological measures was stratified according to magnitude of the pretest to post-test probability shift, precision (repeatability of the results), and study quality. Each of these values were represented on a 2×2 quadrant (magnitude×precision) as *not recommended* (red quadrant), *cautiously recommended* (yellow quadrants) or *recommended* (green quadrant) if the study quality was high.

We determined that the diagnostic utility of clinical examination and diagnostic imaging in isolation are limited and recommend a comprehensive diagnostic approach of patient symptoms, clinical signs and diagnostic imaging. We recognise that the diagnostic capability of matching symptoms, clinical signs and diagnostic imaging is unknown for patients with hip-related pain and recommend that future studies be considered in determining such diagnostic utilities.

<sup>1</sup>Orthopedic Surgery, Duke University Medical Center, Durham, North Carolina, USA

<sup>2</sup>Department of Orthopaedic Surgery, Erasmus University Medical Center, Rotterdam, Netherlands  
<sup>3</sup>Latrobe Sports Exercise Medicine Research Centre, School of Allied Health, Human Services and Sport, La Trobe University, Melbourne, Victoria, Australia  
<sup>4</sup>Department of Orthopaedic Surgery, Erasmus MC Center for Groin Injuries, Erasmus University Medical Center, Rotterdam, Netherlands  
<sup>5</sup>Aspetar Sports Groin Pain Centre, Aspetar Orthopaedic and Sports Medicine Hospital, Doha, Ad Dawhah, Qatar  
<sup>6</sup>Department of Orthopaedic Surgery, Erasmus University Medical Centre, Rotterdam, Netherlands  
<sup>7</sup>Elite Sports Imaging, SL, Madrid, Spain  
<sup>8</sup>Musculoskeletal Radiology, Corades, LLC, Brookline, Massachusetts, USA  
<sup>9</sup>Health Sciences, Lund University, Lund, Sweden  
<sup>10</sup>Sports Orthopaedic Research Center—Copenhagen (SORC-C), Arthroscopic Center, Department of Orthopedic Surgery, Copenhagen University Hospital, Amager-Hvidovre, Denmark, Amager-Hvidovre Hospital, Hvidovre, Copenhagen, Denmark  
<sup>11</sup>Division of Orthopaedic surgery, Oslo University Hospital, Oslo, Norway  
<sup>12</sup>Warwick Orthopaedics, University of Warwick, Coventry, UK  
<sup>13</sup>Orthopaedics Warwick Medical School, University of Warwick, Coventry, UK  
<sup>14</sup>Family Practice & Kinesiology, The University of British Columbia, Vancouver, British Columbia, Canada  
<sup>15</sup>Research, Schulthess Clinic Human Performance Lab, Zurich, ZH, Switzerland  
<sup>16</sup>Physical Therapy, Washington University School of Medicine in Saint Louis, Saint Louis, Missouri, USA  
<sup>17</sup>Human Performance Lab, Schulthess Clinic, Zurich, Switzerland  
<sup>18</sup>Laboratory of Exercise and Health, ETH Zurich, Schwerzenbach, Switzerland  
<sup>19</sup>School of Allied Health Sciences, Griffith University, Gold Coast, Queensland, Australia  
<sup>20</sup>Menzies Health Institute Queensland, Griffith University, Brisbane, Queensland, Australia  
<sup>21</sup>Division of Physical Therapy, The Ohio State University, Columbus, Ohio, USA  
<sup>22</sup>Department of Physiotherapy, Australian Institute of Sport, Canberra, Australian Capital Territory, Australia  
<sup>23</sup>Australian Collaboration for Research into Injury in Sport and its Prevention (ACRISP), Federation University Australia, Ballarat, Victoria, Australia  
<sup>24</sup>Department of Cardiology, Alfred Health, Melbourne, Victoria, Australia  
<sup>25</sup>School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane, Queensland, Australia  
<sup>26</sup>Department of Orthopaedic Surgery, University of Oxford, Institute of Musculoskeletal Sciences, Oxford, UK  
<sup>27</sup>Swiss Olympic Medical Center, Hopital de la Tour, Meyrin, Geneva, Switzerland  
<sup>28</sup>Sports Medicine, University Hospital of Lausanne, Lausanne, VD, Switzerland  
<sup>29</sup>Physical Therapy, University of British Columbia, Vancouver, British Columbia, Canada  
<sup>30</sup>Faculty of Health, University of Technology Sydney, Sydney, New South Wales, Australia  
<sup>31</sup>Department of Orthopedic Surgery, Copenhagen University Hospital, Amager-Hvidovre, Sports Orthopedic Research Center - Copenhagen (SORC-C), Hvidovre, Denmark  
<sup>32</sup>La Trobe Sport and Exercise Medicine Research Centre, School of Allied Health, Human Services, and Sport, La Trobe University, Bundoora, Victoria, Australia  
<sup>33</sup>School of Health and Rehabilitation Sciences, University of Queensland, Brisbane, Queensland, Australia  
<sup>34</sup>Department of Orthopaedics, Schulthess Klinik, Zurich, Switzerland  
<sup>35</sup>Physical Therapy & Athletic Training, Boston University, Boston, Massachusetts, USA

<sup>36</sup>Physiotherapy, HES-SO Valais, University of Applied Sciences Western Switzerland, Leukerbad, Valais, Switzerland  
<sup>37</sup>Oslo Sports Trauma Research Centre (OSTRC), Norwegian School of Sport Sciences, Oslo, Norway  
<sup>38</sup>Department of Sport Medicine, Norwegian School of Sport Sciences, Oslo, Norway  
<sup>39</sup>Division of Orthopaedic Surgery, Oslo University Hospital, Oslo, Norway  
<sup>40</sup>La Trobe Sport and Exercise Medicine Research Centre, School of Allied Health, Human Services and Sport, La Trobe University, Melbourne, Victoria, Australia  
<sup>41</sup>Research & Scientific Support, Aspetar Orthopaedic and Sports Medicine Hospital, Doha, Qatar  
<sup>42</sup>College of Nursing and Health Sciences, University of Vermont, Burlington, Vermont, USA  
<sup>43</sup>Sports Medicine, ASPETAR Orthopedic and Sports Medicine Hospital, Doha, Qatar  
<sup>44</sup>Department for Continuing Education, University of Oxford, Oxford, UK

**Correspondence to** Rintje Agricola, Department of Orthopaedic Surgery, Erasmus University Medical Center, 3015 GD Rotterdam, Netherlands; r.agricola@erasmusmc.nl

**Twitter** Michael P Reiman @MikeReiman, Rintje Agricola @RintjeAgricola, Joanne L Kemp @JoanneLKemp, Joshua J Heerey @JHeerey, Pim van Klij @pimvklij, Andrea B Mosler @AndreaBMosler, Eva Ageberg @EvaAgeberg, Damian Griffin @DamianGriffin, Nicola C Casartelli @NicCasartelli, Laura E Diamond @lauradiamond05, Michael Drew @mickdrew, Daniel J Friedman @ddfriedman, Boris Gojanovic @drsportsante, Marcie Harris-Hayes @MHarrisHayes, Franco M Impellizzeri @francoimpell, Lasse Ishøi @Lasselshoei, Matthew G King @mattgking1, Peter R Lawrenson @PeteLawrenson, Cara L Lewis @ProfCaraLewis, Håvard Moksnes @HMoksnes, Mark J Scholes @MarkScholes85, Adam I Semciw @ASemciw, Andreas Semer @asermer, Kristian Thorborg @KThorborg, Adam Virgile @adamvirgile, Tobias Wörner @Wuninho and H Paul Dijkstra @DrPaulDijkstra

**Contributors** AV, RA, MPR and HPD contributed to the conception of the work. All authors contributed to the interpretation, drafting and revision of the infographic and gave their final approval.

**Funding** The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

**Competing interests** None declared.

**Patient consent for publication** Not required.

**Provenance and peer review** Not commissioned; externally peer reviewed.



**OPEN ACCESS**

**Open access** This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

© Author(s) (or their employer(s)) 2020. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.



**To cite** Reiman MP, Agricola R, Kemp JL, *et al.*  
*Br J Sports Med* Epub ahead of print: [please include  
 Day Month Year]. doi:10.1136/bjsports-2020-102219

Accepted 27 July 2020

*Br J Sports Med* 2020;**0**:1–3.  
 doi:10.1136/bjsports-2020-102219

#### ORCID iDs

Michael P Reiman <http://orcid.org/0000-0003-4557-3446>  
 Rintje Agricola <http://orcid.org/0000-0002-0645-093X>  
 Joanne L Kemp <http://orcid.org/0000-0002-9234-1923>  
 Joshua J Heerey <http://orcid.org/0000-0001-8691-1830>  
 Pim van Klij <http://orcid.org/0000-0002-6515-8322>  
 Ara Kassarian <http://orcid.org/0000-0002-9969-3227>  
 Andrea B Mosler <http://orcid.org/0000-0001-7353-2583>  
 Eva Ageberg <http://orcid.org/0000-0002-8639-3006>  
 Kristian Marstrand Warholm <http://orcid.org/0000-0003-0978-0667>  
 Karim M Khan <http://orcid.org/0000-0002-9976-0258>  
 Kay M Crossley <http://orcid.org/0000-0001-5892-129X>  
 Nicola C Casartelli <http://orcid.org/0000-0002-1280-866X>  
 Laura E Diamond <http://orcid.org/0000-0002-2197-1856>  
 Boris Gojanovic <http://orcid.org/0000-0001-5075-9371>

Marcie Harris-Hayes <http://orcid.org/0000-0003-4274-1651>  
 Franco M Impellizzeri <http://orcid.org/0000-0002-1703-2573>  
 Lasse Ishoi <http://orcid.org/0000-0002-2716-6567>  
 Matthew G King <http://orcid.org/0000-0003-0470-5924>  
 Peter R Lawrenson <http://orcid.org/0000-0002-6479-6840>  
 Cara L Lewis <http://orcid.org/0000-0002-9888-4902>  
 Mark J Scholes <http://orcid.org/0000-0001-9216-1597>  
 Adam I Semciw <http://orcid.org/0000-0001-5399-7463>  
 Andreas Serner <http://orcid.org/0000-0003-4308-901X>  
 Kristian Thorborg <http://orcid.org/0000-0001-9102-4515>  
 Adam Virgile <http://orcid.org/0000-0003-2146-7964>  
 Tobias Wörner <http://orcid.org/0000-0001-5555-0876>  
 H Paul Dijkstra <http://orcid.org/0000-0003-3166-1357>

#### REFERENCES

- Weir A, Brukner P, Delahunty E, *et al.* Doha agreement meeting on terminology and definitions in groin pain in athletes. *Br J Sports Med* 2015;49:768–74.
- Griffin DR, Dickenson EJ, O'Donnell J, *et al.* The Warwick agreement on femoroacetabular impingement syndrome (FAI syndrome): an international consensus statement. *Br J Sports Med* 2016;50:1169–76.
- Nepple JJ, Prather H, Trousdale RT, *et al.* Clinical diagnosis of femoroacetabular impingement. *J Am Acad Orthop Surg* 2013;21:S16–19.
- Reiman MP, Thorborg K, Covington K, *et al.* Important clinical descriptors to include in the examination and assessment of patients with femoroacetabular impingement syndrome: an international and multi-disciplinary Delphi survey. *Knee Surg Sports Traumatol Arthrosc* 2017;25:1975–86.
- Reiman MP, Agricola R, Kemp JL, *et al.* Consensus recommendations on the classification, definition and diagnostic criteria of hip-related pain in young and middle-aged active adults from the International Hip-related pain research network, Zurich 2018. *Br J Sports Med* 2020.
- Impellizzeri FM, Jones DM, Griffin D, *et al.* Patient-Reported outcome measures for hip-related pain: a review of the available evidence and a consensus statement from the International Hip-related pain research network (IHIPRN) meeting, Zurich, 2018. *Br J Sports Med* 2020.
- Mosler AB, Kemp J, King M, *et al.* Standardised measurement of physical capacity in young and middle-aged active adults with hip-related pain: recommendations from the first international Hip-related pain research network (IHIPRN) meeting, Zurich, 2018. *Br J Sports Med* 2019.
- Kemp JL, Risberg MA, Mosler A, *et al.* Physiotherapist-led treatment for young to middle-aged active adults with hip-related pain: consensus recommendations from the International Hip-related pain research network, Zurich 2018. *Br J Sports Med* 2019.