

Research Space

Journal article

Reframing return-to-sport postpartum: the 6 Rs framework.

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Supplemental material for:

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Supplementary 2

Considerations relevant to the perinatal athlete

We have compiled a list of references that are relevant for female specific and/or perinatal exercise. This list is not exhaustive and serves to signpost readers to wider reading to help understand female specific considerations and the impact they may have for performance and exercise during the perinatal period.

Table 1. Relevant references for perinatal considerations

Type	Relevant references
UK Governmental guidance	Chief Medical Officers Physical Activity Guidelines, UK (Pregnancy) Chief Medical Officers Physical Activity Guidelines, UK (Postpartum)
Canadian Governmental guidance	https://bjsm.bmj.com/content/52/21/1339
American Governmental guidance	https://www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2020/04/physical-activity-and-exercise-during-pregnancy-and-the-postpartum-period
Clinical guidelines on return-to-running postpartum	Returning to running postnatal - guidelines for medical, health and fitness professionals managing this population Infographic. Guidance for medical, health and fitness professionals to support women in returning to running postnatally
BJSM Blog	https://blogs.bmj.com/bjsm/2019/05/20/ready-steadygo-ensuring-postnatal-women-are-run-ready/
BJSM e-edition: Female athlete health	https://bjsm.bmj.com/pages/bjsm-e-edition-female-athlete-health/

The 6 Rs framework

We have compiled a list of relevant references for each phase of the 6 Rs framework. This list is not meant to be exhaustive, rather it signposts readers to wider reading to help understand the considerations key to each stage of return to sport postpartum.

Table 2. Relevant references for each phase of the 6 Rs framework for managing the perinatal athlete

Framework phase	Relevant references
<p>1. Ready</p>	<p>Bø K, Artal R, Barakat R, Brown W, <i>et al.</i> <u>Exercise and pregnancy in recreational and elite athletes: 2016 evidence summary from the IOC expert group meeting, Lausanne. Part 1-exercise in women planning pregnancy and those who are pregnant.</u> <i>Br J Sports Med.</i> 2016;50(10):571-89. doi: 10.1136/bjsports-2016-096218.</p> <p>Mottola MF, Davenport MH, Ruchat S, <i>et al.</i> 2019 <u>Canadian guideline for physical activity throughout pregnancy.</u> <i>Br J Sports Med.</i> 2018;52:1339-1346.</p> <p>Davenport MH, Marchand A, Mottola MF, <i>et al.</i> <u>Exercise for the prevention and treatment of low back, pelvic girdle and lumbopelvic pain during pregnancy: a systematic review and meta-analysis</u> <i>Br J Sports Med.</i> 2019;53:90-98. doi: 10.1136/bjsports-2018-099400.</p> <p>Bø K, Artal R, Barakat R, Brown W, <i>et al.</i> <u>Exercise and pregnancy in recreational and elite athletes: 2016 evidence summary from the IOC expert group meeting, Lausanne. Part 2-the effect of exercise on the fetus, labour and birth.</u> <i>Br J Sports Med.</i> 2016;50(21):1297-1305. doi: 10.1136/bjsports-2016-096810.</p> <p>Pelvic Obstetric and Gynaecological Physiotherapy. GOOD PRACTICE STATEMENT Supine lying during pregnancy. <i>JPOGP.</i> 2018; Spring(122):77-83</p> <p>Deering RE, Christopher SM, Heiderscheid BC. <u>From Childbirth to the Starting Blocks: Are We Providing the Best Care to Our Postpartum Athletes?</u> <i>J Ortho Sports Phys Ther.</i> 2020;50:6:281-284. doi: 10.2519/jospt.2020.0607</p> <p>Brown KM, Handa VL, Macura KJ, & DeLeon VB (2012). <u>Three-dimensional shape differences in the bony pelvis of women with pelvic floor disorders.</u> <i>International Urogynecology Journal</i>, 24(3), 431–439. doi:10.1007/s00192-012-1876-y</p> <p>Heather AK, Thorpe H, Ogilvie M, <i>et al.</i> <u>Biological and Socio-Cultural Factors Have the Potential to Influence the Health and Performance of Elite Female Athletes: A Cross Sectional Survey of 219 Elite Female Athletes in Aotearoa New Zealand.</u> <i>Frontiers in Sports and Active Living.</i> 2021;3:27 doi: 10.3389/fspor.2021.601420</p> <p>de Mattos Lourenco, TR, Matsuoka, PK, Baracat, EC <i>et al.</i> <u>Urinary incontinence in female athletes: a systematic review.</u> <i>Int Urogynecol J</i> 29, 1757–1763 (2018). https://doi.org/10.1007/s00192-018-3629-z</p> <p>Cardoso AMB, Lima CROP, Ferreira CWS. <u>Prevalence of urinary incontinence in high-impact sports athletes and their association with knowledge, attitude and practice about this dysfunction.</u> <i>Eur J Sport Sci.</i> 2018;18(10):1405-1412. doi:10.1080/17461391.2018.1496146</p>
<p>2. Review</p>	<p>Mountjoy M, Sundgot-Borgen JK, Burke LM, <i>et al.</i> <u>IOC consensus statement on relative energy deficiency in sport (RED-S): 2018 update.</u> <i>Br J Sports Med.</i> 2018;52(11):687-697. doi: 10.1136/bjsports-2018-099193.</p> <p>Martin D, Sale C, Cooper SB, <i>et al.</i> <u>Period Prevalence and Perceived Side Effects of Hormonal Contraceptive Use and the Menstrual Cycle in Elite Athletes,</u> <i>Int J Sports Physiol Perf.</i> 2018;12(7):926-932.</p>

	<p>Casey EK, Temme K. <u>Pelvic floor muscle function and urinary incontinence in the female athlete</u>. <i>Phys Sportsmed</i>.2017;45(4):399-407. doi: 10.1080/00913847.2017.1372677</p> <p>Cardoso AMB, Lima CROP, Ferreira CWS. <u>Prevalence of urinary incontinence in high-impact sports athletes and their association with knowledge, attitude and practice about this dysfunction</u>. <i>Eur J Sport Sci</i>. 2018;18(10):1405-1412. doi:10.1080/17461391.2018.1496146</p> <p>Moore, I.S., James, M.L., Brockwell, E., et al. <u>Multidisciplinary, biopsychosocial factors contributing to return to running and running related stress urinary incontinence in postpartum women</u>. <i>Br J Sports Med</i>, 2021;bjsports-2021-104168.10.1136/bjsports-2021-104168.</p> <p>Donnelly, G.M., Brockwell, E., Rankin, A. and Moore I. S. Beyond the musculoskeletal system: considering whole-systems readiness for running postpartum. <i>Journal of Women's Health Physical Therapy</i>, 2021;46(1)</p>
<p>3. Restore</p>	<p>Bø K, Artal R, Barakat R, Brown WJ, et al. <u>Exercise and pregnancy in recreational and elite athletes: 2016/17 evidence summary from the IOC Expert Group Meeting, Lausanne. Part 3-exercise in the postpartum period</u>. <i>Br J Sports Med</i>. 2017;51(21):1516-1525. doi: 10.1136/bjsports-2017-097964.</p> <p>Mountjoy M, Sundgot-Borgen JK, Burke LM, et al. <u>IOC consensus statement on relative energy deficiency in sport (RED-S): 2018 update</u>. <i>Br J Sports Med</i>. 2018;52(11):687-697. doi: 10.1136/bjsports-2018-099193.</p> <p><u>Returning to running postnatal - guidelines for medical, health and fitness professionals managing this population</u>.</p> <p>Donnelly GM, Rankin A, Mills H, et al. <u>Infographic. Guidance for medical, health and fitness professionals to support women in returning to running postnatally</u> <i>British Journal of Sports Medicine</i> 2020;54:1114-1115.</p>
<p>4. Recondition</p>	<p>Bø K, Artal R, Barakat R, Brown WJ, et al. <u>Exercise and pregnancy in recreational and elite athletes: 2016/2017 evidence summary from the IOC expert group meeting, Lausanne. Part 5. Recommendations for health professionals and active women</u>. <i>Br J Sports Med</i>. 2018;52(17):1080-1085. doi: 10.1136/bjsports-2018-099351.</p> <p><u>Returning to running postnatal - guidelines for medical, health and fitness professionals managing this population</u>.</p> <p>Donnelly GM, Rankin A, Mills H, et al. <u>Infographic. Guidance for medical, health and fitness professionals to support women in returning to running postnatally</u> <i>British Journal of Sports Medicine</i> 2020;54:1114-1115.</p> <p>Moore, I.S., James, M.L., Brockwell, E., et al. <u>Multidisciplinary, biopsychosocial factors contributing to return to running and running related stress urinary incontinence in postpartum women</u>. <i>Br J Sports Med</i>, 2021;bjsports-2021-104168.10.1136/bjsports-2021-104168.</p> <p>Donnelly, G.M., Brockwell, E., Rankin, A. and Moore I. S. Beyond the musculoskeletal system: considering whole-systems readiness for running postpartum. <i>Journal of Women's Health Physical Therapy</i>, 2021;46(1)</p>

<p>5. Return</p>	<p>Shrier I. <u>Strategic Assessment of Risk and Risk Tolerance (StARRT) framework for return-to-play decision-making</u>. <i>Br J Sports Med</i>. 2015 Oct;49(20):1311-5. doi: 10.1136/bjsports-2014-094569.</p> <p>Tassignon B, Verschueren J, Delahunt E, <i>et al</i>. <u>Criteria-Based Return to Sport Decision-Making Following Lateral Ankle Sprain Injury: a Systematic Review and Narrative Synthesis</u>. <i>Sports Med</i>. 2019 Apr;49(4):601-619. doi: 10.1007/s40279-019-01071-3.</p> <p>Podlog L, Heil J, Schulte S. <u>Psychosocial factors in sports injury rehabilitation and return to play</u>. <i>Phys Med Rehabil Clin N Am</i>. 2014;25(4):915-30. doi: 10.1016/j.pmr.2014.06.011.</p> <p>Webster KE, Feller JA, Lambros C. <u>Development and preliminary validation of a scale to measure the psychological impact of returning to sport following anterior cruciate ligament reconstruction surgery</u>. <i>Phys Ther Sport</i>. 2008;9(1):9-15. doi: 10.1016/j.ptsp.2007.09.003.</p> <p>Bø K, Nygaard IE. <u>Is Physical Activity Good or Bad for the Female Pelvic Floor? A Narrative Review</u>. <i>Sports Med</i>. 2020;50(3):471-484. doi: 10.1007/s40279-019-01243-1.</p> <p>Gabbett TJ. <u>How Much? How Fast? How Soon? Three Simple Concepts for Progressing Training Loads to Minimize Injury Risk and Enhance Performance</u>. <i>J Ortho Sports Phys Ther</i>.2020;50(10):570-573. doi: 10.2519/jospt.2020.9256</p>
<p>6. Refine</p>	<p>Sale C, Elliott-Sale KJ. <u>Nutrition and Athlete Bone Health</u>. <i>Sports Med</i>. 2019;49:139–151. https://doi.org/10.1007/s40279-019-01161-2</p> <p>Clarsen B, Bahr R, Myklebust G, <i>et al</i>. <u>Improved reporting of overuse injuries and health problems in sport: an update of the Oslo Sport Trauma Research Center questionnaires</u>. <i>Br J Sports Med</i>. 2020;54:390-396. doi:10.1136/bjsports-2019-101337</p> <p>Kalkhoven JT, Watsford ML, Coutts AJ <i>et al</i>. <u>Training Load and Injury: Causal Pathways and Future Directions</u>. <i>Sports Med</i> 2021;51, 1137–1150. https://doi.org/10.1007/s40279-020-01413-6</p> <p>Bittencourt NFN, Meeuwisse WH, Mendonça LD, <i>et al</i>. <u>Complex systems approach for sports injuries: moving from risk factor identification to injury pattern recognition—narrative review and new concept</u>. <i>Br J Sports Med</i>.2016;50:1309-1314.</p> <p>Mountjoy M, Sundgot-Borgen JK, Burke LM, <i>et al</i>. <u>IOC consensus statement on relative energy deficiency in sport (RED-S): 2018 update</u>. <i>Br J Sports Med</i>. 2018;52(11):687-697. doi: 10.1136/bjsports-2018-099193.</p> <p>Moore, I.S., James, M.L., Brockwell, E., <i>et al</i>. <u>Multidisciplinary, biopsychosocial factors contributing to return to running and running related stress urinary incontinence in postpartum women</u>. <i>Br J Sports Med</i>, 2021:bjsports-2021-104168.10.1136/bjsports-2021-104168.</p> <p>Donnelly, G.M., Brockwell, E., Rankin, A. and Moore I. S. Beyond the musculoskeletal system: considering whole-systems readiness for running postpartum. <i>Journal of Women's Health Physical Therapy</i>, 2021;46(1)</p>