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| **Screening for readiness to run after childbirth** |
| **Screening Topic** | **Screening Overview** |
| **Pelvic & abdominal health** | SUBJECTIVE:· Do you experience urine leakage when you cough/sneeze/laugh/ exercise?· Do you have a bulge or sense something falling out of the vaginal area?[20](https://paperpile.com/c/ajoqCy/UFIsR)· Do you experience accidental leakage of feces?· Do you experience pain with bowel movements, tampon use, or intercourse?· Do you experience pain or bulging in the abdomen?OBJECTIVE:· Can use the Pelvic Floor Disability Inventory- 20 (PFDI-20)[21](https://paperpile.com/c/ajoqCy/TQEQP)· Pelvic floor muscle strength, endurance, coordination, excursion in supine & standing· Grade 3 or less score on the Modified Oxford Manual Muscle Testing (MOMMT) and presence of pelvic health symptoms may warrant more time in phase I of the running progression.[15](https://paperpile.com/c/ajoqCy/KFlvZ)· Measurement of the genital hiatus and perineal body portions of the POP-Q[35](https://paperpile.com/c/ajoqCy/JSCDA)· If the sum of these two measurements is greater than 7cm on Valsalva,[36](https://paperpile.com/c/ajoqCy/v88VX) a pessary may be recommended for use during running.15· Assessment of pelvic floor muscle quality (e.g., elevated resting tone) and pain provocation with palpation· Measurement of inter-recti distance at rest and with head lift. Measurement methods include ultrasound, calipers, tape measure, or finger widths based on availability.· Active straight leg raise (ASLR) test[17,18](https://paperpile.com/c/ajoqCy/pEltF%2BCQD6G)· Perceived difficulty without and with external pelvic compression· Provocation of pelvic joint pain · Trunk/pelvic shift, rib flare, or breath holding· Abdominal muscle strength (resisted trunk rotation, head lift, manual muscle testing & endurance (forward plank) testing.[19](https://paperpile.com/c/ajoqCy/8CzJF)· Orthopedic assessment of pelvic joints, hip, lumbar spine. |
| **Impact readiness** | · Goom et al (2020)[15](https://paperpile.com/c/ajoqCy/KFlvZ): The lower extremity screen is quantitative and includes the ability to perform 20 reps of each of the following exercises to assess strength: Single leg calf raise, single leg bridge, single leg sit to stand, side lying hip abduction. Impact readiness is assessed with jogging in place for 1 minute and completion of forward bounding and hopping in place for 10 repetitions.· Payne et al (2019)[14](https://paperpile.com/c/ajoqCy/F1d61): The Running Readiness Screen (RRS) was developed to screen for muscular endurance and lower extremity dynamic control through the use of 6 screening tests. These tests include the following, each of which is tested for 1 minute: Step Ups, Double Leg Hopping, Wall Sit, Single Leg Squats, Double Leg Squat and Plank Hold. Clinicians score based on muscular endurance, postural and joint alignment, and weight distribution. It is our expert opinion that this could be used to screen people who desire to run after giving birth.Musculoskeletal and pelvic health symptoms should be evaluated during the impact readiness screening. |
| **Running gait** | 2D or 3D Visual analysis· Souza (2016)[43](https://paperpile.com/c/ajoqCy/0K6vx): 2D Analysis· Set up: High-definition camera with high frame rate (>120Hz), two orthogonal views (at right angles to each other) and application of markers on anatomical landmarks.· Analysis: After a warm up, foot strike pattern, foot inclination angle at initial contact, tibia angle loading response, knee flexion during stance, hip extension during late stance, trunk lean, stride length, and vertical displacement are analyzed from the sagittal view. Base of support, heel eversion, foot progression angle, heel whips, knee window, and pelvic drop are analyzed from the frontal view. Other variables such as cadence (step rate), shaking of treadmill and atypical impact sounds are monitored.[43](https://paperpile.com/c/ajoqCy/0K6vx) |
| **Physiological variables/multi-systems review** | · **Sleep:** Postpartum women experience significant sleep disruptions after childbirth due to infant sleep and feeding patterns.[44,45](https://paperpile.com/c/ajoqCy/iLFxN%2BQcprz) No studies have investigated the effects of postpartum state sleep deprivation on and its relationship with performance, recovery, or injury; however, athletes need 9-10 hours of sleep for optimal performance.[52–54](https://paperpile.com/c/ajoqCy/TUndn%2B2FBUj%2B7CrlH) We recommend monitoring sleep by simply asking for average sleep hours per week and if needed, analyzing the quality of sleep using the Pittsburgh sleep quality index.[57](https://paperpile.com/c/ajoqCy/Ct2mS)· **Fatigue**: In athletes, insufficient recovery time, excessive training load, and intensity are associated with fatigue.[48,49](https://paperpile.com/c/ajoqCy/FNTXd%2B8ODd1) Fatigue affects 60% of new parents.[46,47](https://paperpile.com/c/ajoqCy/gFIJu%2BLW0sR) In athlete populations, fatigue positively correlates with underperformance and injury.[48](https://paperpile.com/c/ajoqCy/FNTXd) Although fatigue has been well documented in postpartum and athlete populations respectively, it has not been studied in postpartum athlete populations. Nonetheless, running workload (frequency, intensity, duration) should be discussed with fatigued postpartum runners. Fatigue can be measured using the postpartum accumulated fatigue scale which measures physical, emotional, and cognitive fatigue.[55,56](https://paperpile.com/c/ajoqCy/ZXlSX%2Bu0eoZ)· **Nutrition**: Active lactating women should consume an additional 478-502 kcal/day to the 40-45 kcal/kg of fat free mass/day that is recommended for non-lactating female athletes to maintain appropriate energy balance.[50,51](https://paperpile.com/c/ajoqCy/a4lgl%2BWj00P) Body weight should be monitored as a symptom of Relative Energy Deficiency in Sport (RED-S). Caution should be used with standard RED-S screens, as many rely on menstrual cycle symptoms,[16](https://paperpile.com/c/ajoqCy/JBlRA) and lactation may prevent the return of the menstrual cycle even in athletes who have normal energy balance. Milk supply alone should not be used as an indicator of adequate caloric intake, and a lactation specialist should be involved if milk supply is to be considered.· **Cardiovascular:**[22–25](https://paperpile.com/c/ajoqCy/es5ze%2BBTPbs%2Bzv2xD%2BTJhiF) Particularly in the early postpartum period (0-6 weeks), special attention should be paid to cardiovascular health—including blood pressure, red flags for blood clots, red flags for hemorrhage—as gestational hypertension/pre-eclampsia, development of deep vein thromboses/pulmonary emboli, and postpartum hemorrhage may occur after childbirth. Any red flags for cardiovascular impairments warrants immediate referral to a physician or emergency services.· **Infection:**[24,26](https://paperpile.com/c/ajoqCy/l9iK4%2Bzv2xD) Runners in the first six weeks postpartum are at increased risk of childbirth-related infection. Lactating runners may develop mastitis (inflammation of breast tissue that may be associated with infection) at any point postpartum. Red flags for infection and sepsis should be monitored regularly. |