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Physical exercise in postpartum

Exercise prescription and adaptations during early postpartum

Rita Santos Rocha

March 2023

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Physical exercise in postpartum

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- This session addresses the benefits of exercising during the postpartum stages, and the steps for planning, conducting and monitoring early postpartum exercise classes, aiming to help women to resume exercise and sports practice in a transition stage to "normal" life.

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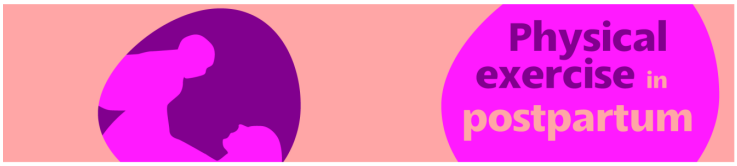

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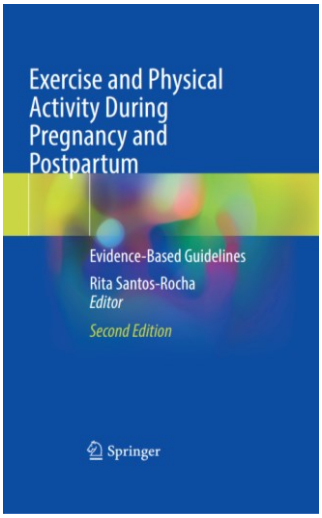
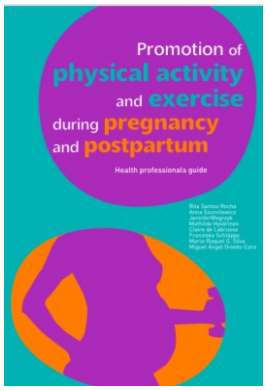
Exercise and Physical Activity During Pregnancy and Postpartum. Evidence-Based Guidelines

Chapter 10 - Exercise prescription and adaptations in early postpartum
Rita Santos-Rocha, Anna Szumilewicz, and Simona Pajaujiene





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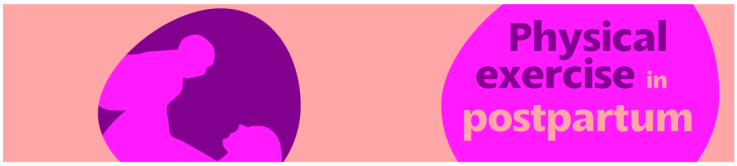

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- **BENEFITS OF PA AND EXERCISE**
- **GUIDELINES FOR PA/EXERCISE**
- **EXERCISE PRESCRIPTION**
- **EXERCISE ADAPTATIONS**

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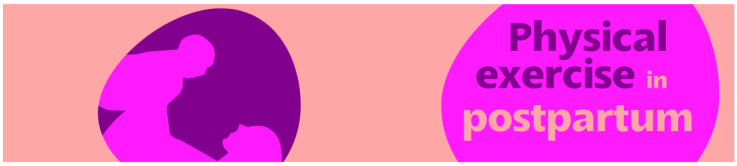

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What is the postpartum period?

- Physiological and morphological changes of pregnancy persist for 4-6 weeks postpartum
- The time periods can be divided into:
  - Immediate/initial postpartum hospital-based (during hospital stay)
  - Early/immediate postpartum (hospital discharge to six weeks postpartum)
  - Later postpartum (six weeks to one year, corresponding to cessation of breastfeeding).

Thus, the postpartum period is defined as the time immediately after birth, but there is no clearly defined end to the postpartum period. Therefore, it is usually considered to be 6 to 26 weeks following the birth (later postpartum).

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What is the postpartum period?

- The postpartum period provides an opportunity for women to begin or reengage in PA.
- Despite the benefits, the majority of women do not resume their pre-pregnancy PA levels after the birth.
- Previously active women who do not resume their pre-pregnancy PA levels may remain inactive for many years.

- The early postpartum period focuses on recovering from delivery and caring for the infant.

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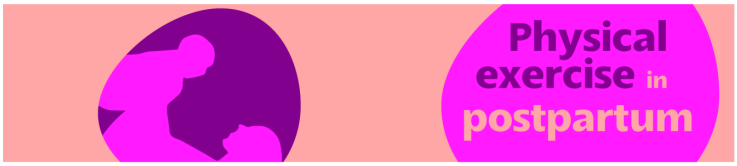

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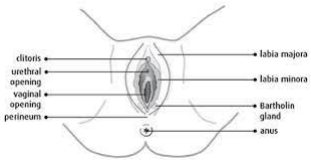
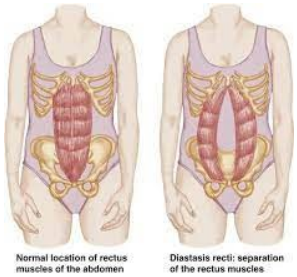
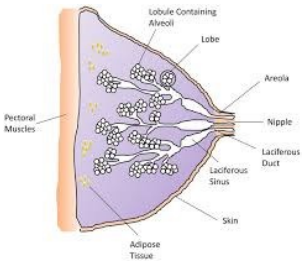
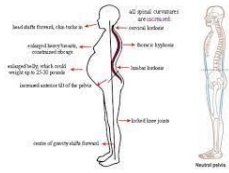
Postpartum adaptations









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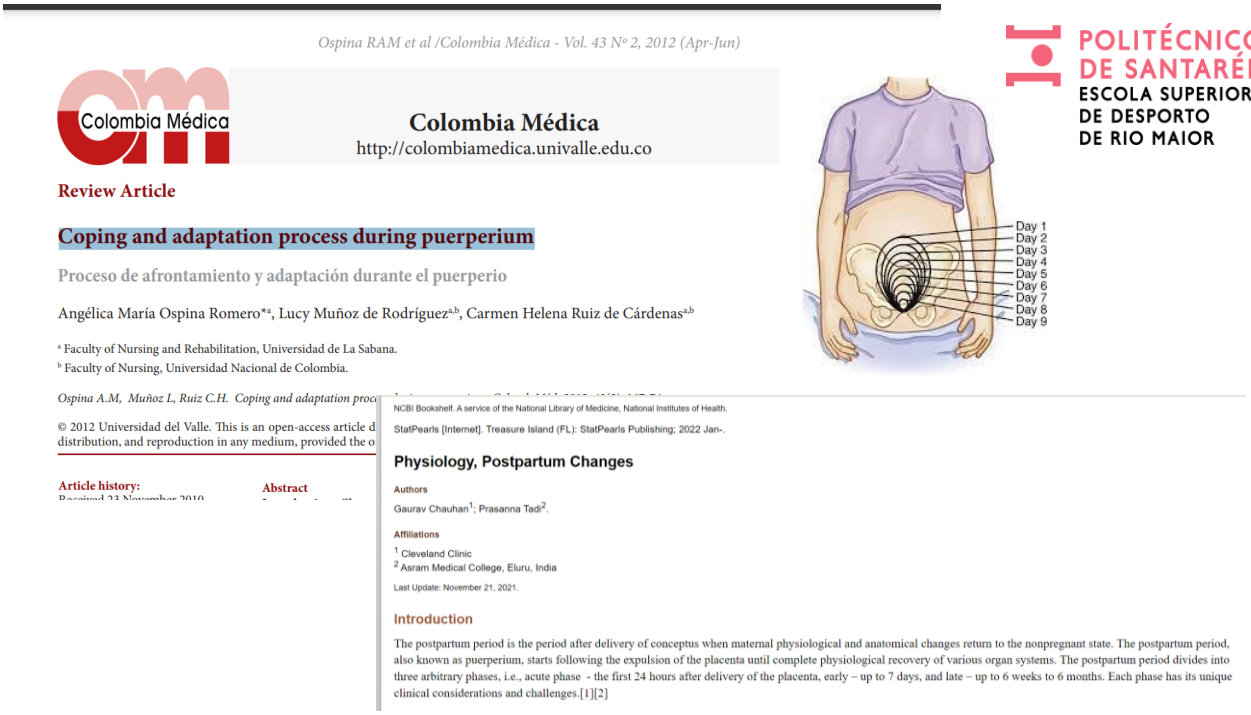

Ospina RAM et al /Colombia Médica - Vol. 43 Nº 2, 2012 (Apr-Jun)

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Review Article

Coping and adaptation process during puerperium

Proceso de afrontamiento y adaptación durante el puerperio

Angélica María Ospina Romero*[a], Lucy Muñoz de Rodríguez[a,b], Carmen Helena Ruiz de Cárdenas[a,b]

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Ospina A.M, Muñoz L, Ruiz C.H. Coping and adaptation proc

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Abstract

NCBI Bookshelf. A service of the National Library of Medicine, National Institutes of Health.

StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-.

Physiology, Postpartum Changes

Authors

Gaurav Chauhan[1]; Prasanna Tadi[2].

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[1] Cleveland Clinic
[2] Asram Medical College, Eluru, India

Last Update: November 21, 2021.

Introduction

The postpartum period is the period after delivery of conceptus when maternal physiological and anatomical changes return to the nonpregnant state. The postpartum period, also known as puerperium, starts following the expulsion of the placenta until complete physiological recovery of various organ systems. The postpartum period divides into three arbitrary phases, i.e., acute phase - the first 24 hours after delivery of the placenta, early – up to 7 days, and late – up to 6 weeks to 6 months. Each phase has its unique clinical considerations and challenges.[1][2]

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Postpartum adaptations

- Regarding the physical adaptations that persist for several weeks after birth, the early postpartum period can be assumed as the "fourth trimester".
  - Postpartum **mood imbalance**
  - Weight retention
  - **Fatigue** is also a common adverse experience
  - Postpartum **urinary incontinence (UI)**
  - **Complications: UI,** pelvic organ prolapse (POP), sexual function, and anal incontinence
  - Altered **posture**

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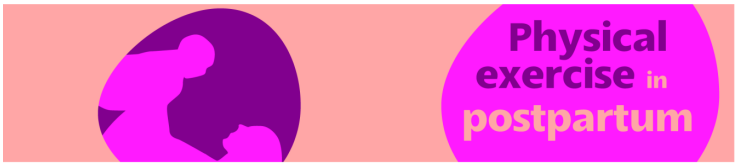

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Postpartum Exercise

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During the past 25 years, numerous research studies have demonstrated significant benefits associated with physical activity during and after pregnancy for both mother and baby. Pregnancy triggers numerous physical changes in a woman's body, including water retention and weight gain. After delivery, many women have difficulty returning to their prepregnancy weight, with an average weight retention of 0.5 to 3.8 kg (1.1 to 8.4 lbs) noted per pregnancy. Nearly 20% of women are more than 5 kg (11 lbs) heavier 6 to 18 months after delivery. Postpartum weight retention is related to inadequate physical activity, poor nutrition, and, in some cases, excessive weight gain during pregnancy. Across time, weight retention, physical inactivity, and poor nutritional choices can lead to a myriad of chronic health conditions, including obesity.

POSTPARTUM EXERCISE CHALLENGES

Whereas the postpartum period is a critical transition time, return to a physically active lifestyle, balanced diet, and a

BENEFITS OF POSTPARTUM EXERCISE

Although conventional wisdom might suggest that exercise will accentuate fatigue, the opposite is generally true. Prolonged rest/physical inactivity actually contributes to fatigue, promotes increased body weight and decreased vigor and mental acuity, and increases the risk of developing future chronic health conditions. An emerging body of evidence indicates that exercise in the postpartum period:

- Reduces fatigue and increases vigor
- Improves mood states and mental acuity
- Improves fitness
- Promotes return to prepregnancy weight
- Decreases the risk for developing future chronic health conditions
- Provides important mom time and social interactions

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Short-term benefits of postpartum physical activity and exercise

- **Improvement in vigor / reduction of fatigue**
- **Improvement in social interactions (social support) and quality of life**
- **Improvement in mood states and mental health**
  - Improvement in **mood**
  - Reduction in postpartum **depression** and **anxiety**

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Yang CL, Chen CH. Effectiveness of aerobic gymnastic exercise on stress, fatigue, and sleep quality during postpartum: A pilot randomized controlled trial. Int J Nurs Stud. 2018 Jan;77:1-7. doi: 10.1016/j.ijnurstu.2017.09.009. Epub 2017 Sep 14. PMID: 28950158.

Interventions: Engage in aerobic gymnastic exercise at least three times (15min per section) a week for three months using compact disc in the home.

Outcome measures: Perceived Stress Scale, Postpartum Fatigue Scale, Postpartum Sleep Quality Scale, and Edinburgh Postnatal Depression Scale.

Results: In a two-way ANOVA with repeated measures, the aerobic gymnastic exercise group showed significant decrease in fatigue after practicing exercise 4 weeks and the positive effects extended to the 12-week posttests. Paired t-tests revealed that aerobic gymnastic exercise participants had improved significantly in perceived stress and fatigue after 4 weeks gymnastic exercise; these positive effects extended to the 12-week posttests. In addition, the changes in physical symptoms-related sleep inefficiency after 12 weeks gymnastic exercise were significantly decreased in the experimental group compared with the control group.

Relevance to clinical practice: The findings can be used to encourage postnatal women to perform moderate-intensity gymnastic exercise in their daily life to reduce their stress, fatigue and improve sleep quality.

Cited by
Publication types
MeSH terms
Related information
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16

Dol J, Richardson B, Murphy GT, Aston M, McMillan D, Campbell-Yeo M. Impact of mobile health interventions during the perinatal period on maternal psychosocial outcomes: a systematic review. JBI Evid Synth. 2020 Jan;18(1):30-55. doi: 10.11124/JBISRIR-D-19-00191. PMID: 31972680.

Results: Of the 1,607 unique articles identified, 106 full-text papers were screened and 24 articles were critically appraised, with 21 included in the final review. Eleven were quasi-experimental and 10 were randomized controlled trials. The mHealth intervention approach varied, with text message and mobile applications being the most common. Length of intervention ranged from four weeks to six months. The topics of the mHealth intervention varied widely, with the most common topic being postpartum depression. Mothers who received an mHealth intervention targeting postpartum depression showed a decreased score on the Edinburgh Postnatal Depression Scale when measured post-intervention (odds ratio = -6.01, 95% confidence interval = -8.34 to -3.67, $p < 0.00001$). The outcomes related to self-efficacy, social support and anxiety showed mixed findings of effectiveness (beneficial and no change) across the studies identified.

Conclusions: This review provides insight into the effectiveness of mHealth interventions targeting mothers in high-income countries in the perinatal period to enhance four psychosocial outcomes: self-efficacy, social support, anxiety and depression. Despite a wide variety of outcome measurements used, the predominant findings suggest that there are insufficient data to conclude that mHealth interventions can improve self-efficacy and anxiety outcomes. Potential benefits on social support were related to interventions targeting postnatal behaviors. Postpartum depression was the mostly commonly reported outcome. Findings related to the comparison of pre-post outcomes and intervention versus control demonstrated that mHealth interventions targeting postpartum depression were associated with a reduction in postpartum depression.

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Turner J, Clanchy K, Vincze L. Telehealth interventions for physical activity and exercise participation in postpartum women: A quantitative systematic review. Prev Med. 2023 Feb;167:107413. doi: 10.1016/j.ypmed.2022.107413. Epub 2023 Jan 2. PMID: 36603606.

population is unclear. This quantitative systematic review will examine the implementation and outcomes of telehealth exercise interventions in the postpartum population to synthesise the degree to which these outcomes have been assessed and evaluated. Five databases were searched from January 2001 to March 2022. Studies implementing synchronous telehealth exercise interventions for postpartum women were included. Interventions were examined against the Template for Intervention Description and Replication (TIDieR) checklist that assesses intervention reporting completeness and replicability. Of the 1036 records identified, 16 studies progressed to data extraction. Six interventions provided individualised exercise prescription, and only four were delivered by university-level exercise practitioners. Physical activity participation was well reported, however health-related outcomes (i.e., muscular strength and aerobic capacity) were very minimally assessed. Only one intervention utilised modern video conferencing as the primary telehealth communication method. With the minimal assessment of health-related outcomes, there is limited scope to assess the effectiveness of these interventions for postpartum women. Future research interventions need to be reported according to a validated trial reporting system and focus on relevant health related outcomes including postpartum depressive symptoms, quality of life, cardiovascular fitness, muscular strength and body composition.

Keywords: Exercise; Humans; Physical activity; Postnatal; Postpartum; Promotion; Telehealth.

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Short-term benefits of postpartum physical activity and exercise

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- **Promotes return to pre-pregnancy weight**
- **Promotes breastfeeding**

Clin Obstet Gynecol. 2015 Dec;58(4):885-92. doi: 10.1097/GRF.0000000000000143.

Postpartum Exercise and Lactation.

Bane SM[1].

Author information

Abstract

Many women who are breastfeeding also want to participate in exercise, but have concerns about the safety of their newborn. The following chapter reviews issues related to postpartum exercise and lactation. The goals of the chapter are to help clinicians understand the benefits of exercise, examine the impact of postpartum exercise on breastfeeding, and provide practical recommendations for exercise during the postpartum period in women who are breastfeeding.

PMID: 26398298 DOI: 10.1097/GRF.0000000000000143

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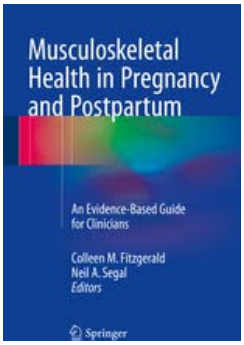
Short-term benefits of postpartum physical activity and exercise

- Reduction of **urinary incontinence** are **other** health issues related to physical activity and exercise during the early postpartum, such as **core** muscle's function and **DRA** (?).
- Improvement in cardiorespiratory **fitness**, and of **other fitness** components (i.e., muscular fitness/functionality, body composition) and **posture**



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Thabet AA, Alshehri MA. Efficacy of deep core stability exercise program in postpartum women with diastasis recti abdominis: a randomised controlled trial. J Musculoskelet Neuronal Interact. 2019 Mar 1;19(1):62-68. PMID: 30839304

Objectives: This study was aimed at discovering the efficacy the deep core stability exercise program has on the closure of diastasis recti and on the overall improvement in the quality of life for postpartum women.

Methods: The study group consisted of forty women with diastasis recti, aged between 23 and 33 who were randomly divided into two groups. The 20 women in the first group underwent a deep core stability-strengthening program plus traditional abdominal exercises program, 3 times a week, for a total duration of 8 weeks. The other 20 women, forming the second group, only underwent the traditional abdominal exercises program, 3 times a week for 8 weeks. Following this procedure, the inter-recti separation was measured using digital nylon calipers while the quality of life was measured by Physical Functioning Scale (PF10) for all the participants.

Results: As a result of the use of the deep core stability exercise program, inter-recti separation had a high statistically relevant decrease, (P<0.0001), showing a highly statistically relevant improvement with regard to the quality of life in the study groups (p<0.0001).

Conclusions: The deep core stability exercise program is effective in treating diastasis recti and improving postpartum women's quality of life.

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Kim S, Yi D, Yim J. The Effect of Core Exercise Using Online Videoconferencing Platform and Offline-Based Intervention in Postpartum Woman with Diastasis Recti Abdominis. Int J Environ Res Public Health. 2022 Jun 8;19(12):7031. doi: 10.3390/ijerph19127031. PMID: 35742279;

To investigate the efficacy of exercise intervention using a real-time video conferencing platform (ZOOM) on inter-recti distance, abdominal muscle thickness, static trunk endurance, and maternal quality of life, 37 women with diastasis recti between six months and one year postpartum were randomly divided into the online (n = 19) and offline (n = 18) groups. The online group underwent 40-min trunk stabilization exercise sessions twice a week for six weeks, through a real-time video conference platform, while the offline group attended the same program in person. The inter-recti distance and muscle thickness between the abdominal muscles were measured by rehabilitation ultrasound imaging, the Torso endurance test was used to compare the static trunk endurance, and the maternal quality of life questionnaire (MAPP-QOL, score) was applied. Significant improvements were observed in the inter-recti distance between the rectus abdominis, abdominal muscle thickness, static trunk endurance, and maternal quality of life in both groups ($p < 0.001$); a more significant improvement was observed in the offline group. No significant differences were observed between groups except for the left rectus abdominis thickness and Psychological/Baby and Relational/Spouse-Partner subscale in the maternal quality of life index ($p > 0.05$). Exercise interventions delivered in a real-time videoconferencing platform are effective at improving the inter-recti distance, trunk stability, and quality of life in postpartum women and may be an alternate to face-to-face intervention.

Keywords: diastasis recti; exercise intervention; postpartum; telehealth.

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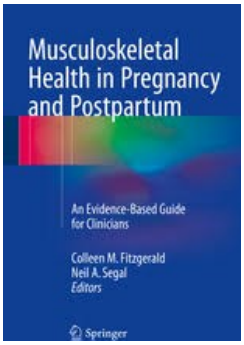
Long-term benefits of postpartum physical activity and exercise

- Promotion of an active and healthy lifestyle (…)
- Reduced risk of future **chronic diseases** (e.g. diabetes, etc.)
- (…)



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Exercise in postpartum

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- There are several guidelines supporting the benefits of exercising during pregnancy and postpartum.
- Scientific research conducted in the last decades has markedly changed the perception of pre and postnatal physical activity, overlapping the conservative approach presented in the first publications.
- However, those guidelines contain **very general recommendations on physical activity** during the postpartum period, **and little information that exercise professionals** could use when programming the contents of targeted exercise classes for early postpartum women.

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Exercise in postpartum

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- There is currently **no specific guidance** on the role of exercise in managing the main postpartum health issues, such as depression, fatigue, UI, and international guidance is inconsistent.
- There is some evidence that to increase physical activity levels in postpartum women educational interventions should be started already during pregnancy.
- Some **systematic review** studies showed that group exercise, participant-chosen exercise, and exercise with co-interventions all may be effective interventions.
- Exercise professionals, having in mind possible situations related to the incomplete recovery of women after childbirth, have to understand the main **facilitators and barriers** to exercise during postpartum.

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Exercise in postpartum

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Barriers

- Mode of delivery
- Discomforts / complications
- Lack of social support (familiy, society, health policies)
- No knowledge (benefits, safety…)
- Fatigue
- Lack of time
- Baby feeding and care
- Standard of living
- Weather
- Culture

Facilitators

- Mode of delivery
- Previous experience PA
- Knowledge about benefits
- Recommendations from EP/HP
- Social support
- Availability of tailored programs
- Weight loss

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BMC Pregnancy Childbirth. 2016 Jun 2;16(1):131. doi: 10.1186/s12884-016-0908-x.

Perceived barriers and enablers of physical activity in postpartum women: a qualitative approach.

Saligheh M[1,2], McNamara B[3], Rooney R[4].

Author information

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Abstract

BACKGROUND:

Postpartum women's recovery from birth can be assisted through increased physical activity (PA). However, women face substantial barriers to participating in exercise and require support to enable them to benefit from increased PA.

METHODS:

This study sought to explore women's beliefs about and experiences of PA and exercise during the 6 weeks to 12 months postpartum period. A cohort of 14 postpartum women from a survey study of the barriers and enablers to exercise participation agreed to take part in interview sessions to provide an in-depth understanding of the women's perceptions of the postpartum period and their physical activity during this time.

RESULTS:

Findings are presented with reference to the social ecological framework and indicate postpartum women face substantial personal and environmental barriers to PA and exercise participation: fatigue, a lack of motivation and confidence, substantial time constraints, lack of access to affordable and appropriate activities and poor access to public transport. In contrast, enablers such as possessing greater social support, in particular partner support, improved PA and exercise participation.

CONCLUSIONS:

The findings encourage facilitation of exercise through mothers' groups, mothers' exercise clubs or postnatal classes suggesting behavioral and social change is needed. Interaction between individuals, community, organizations and policy makers is required. In addition, the provision of specifically tailored and appropriate exercise programs could potentially enable increased PA in postpartum women, thereby improving their health.

KEYWORDS:

Barriers; Enablers; Exercise; Postnatal women

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Midwifery. 2017 Jan 14. pii: S0266-6138(17)30007-4. doi: 10.1016/j.midw.2017.01.003. [Epub ahead of print]

A cross sectional study investigating weight management motivations, methods and perceived healthy eating and physical activity influences in women up to five years following childbirth.

Vincze L[1], Rollo ME[2], Hutchesson MJ[3], Burrows TL[4], MacDonald-Wicks L[5], Blumfield M[6], Collins CE[7].

Abstract

OBJECTIVE: to explore motivations for weight change, weight loss methods used and factors perceived to influence healthy eating and physical activity for weight management following childbirth, and to evaluate differences by socio-demographic, weight status and pregnancy characteristics.

DESIGN: cross-sectional online survey completed from May to August 2013.

PARTICIPANTS: Australian women (n=874, aged 32.8±4.5 years, pre-pregnancy Body Mass Index 25.6±5.7kg/m^2) aged 18-40 years who had given birth in the previous 5 years MEASUREMENTS: women self-reported socio-demographic, weight status and pregnancy characteristics. Those who reported being unhappy at their current weight ranked their most to least important reasons for wanting to change their weight from a list of nine options. Weight control methods used in the previous two years were reported from a list of 12 options. Perceived healthy eating and physical activity factors influencing weight management were assessed across 20 items using a five-point Likert scale.

FINDINGS: the most prevalent motivators reported for weight change were to improve health (26.1%) and lift mood (20.3%). Three-quarters (75.7%) of women reported having used at least one weight loss method in the previous two years. Time constraints due to family commitments, enjoyment of physical activity and healthy eating, motivation and cost were factors most commonly reported to influence weight management. Body mass index, parity, education, household income and time since last birth were related to motivations for weight change, weight loss methods used and/or factors perceived to influence weight management.

IMPLICATIONS FOR PRACTICE: weight management support provided by health professionals should consider women's expressed motivators and factors influencing weight management, along with differences in sociodemographic, pregnancy and weight status characteristics, in order to engage women at this life-stage and facilitate adoption of healthy lifestyle behaviours.

KEYWORDS:

Diet; Exercise; Postpartum period; Surveys and questionnaires; Weight loss

PMID: 28131329 DOI: 10.1016/j.midw.2017.01.003

Similar articles

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Ann Agric Environ Med. 2016 Sep;23(3):502-5. doi: 10.5604/12321966.1219195.

Physical activity patterns, depressive symptoms and awareness of cardiovascular risk factors in postpartum women.

Szalewska D[1], Skrzypkowska M[1].

Abstract

INTRODUCTION AND OBJECTIVES:

Although physical activity has been found to reduce the risk of cardiovascular diseases and depression in the general population, little is known about physical patterns and the link with postnatal depressive symptoms and awareness of cardiovascular risk factors in postpartum women. The aim of this study was to examine physical activity patterns and their link to depressive symptoms in postpartum women. The secondary endpoint was the assessment of health awareness in women six months after delivery.

MATERIAL AND METHODS:

Eighty postpartum women with a mean age of 27±4 years (group A - 40 physically active women, group B - 40 women leading a sedentary lifestyle) completed a self-report questionnaire and The Edinburgh Postnatal Depression Scale (EPDS) questionnaire.

RESULTS:

In group A, the types of physical activity undertaken in the six-month period after delivery were as follows: 20 women - housework (180 min/session), 18 women - gentle walks (180 min/session), 16 women - group fitness classes (60 min/session), 6 - rapid walking (40 min/session), 3 women - swimming (60 min/session), 2 women - jogging (45 min/session), 1 woman - squash, (45 min/session) 1 - dancing (90 min/session), 1 - tennis (60min/session). Group B declared a sedentary lifestyle and physical activity of less than 30 min a day. The level of health awareness was statistically better in women who were physically active six months after delivery than in women who led a sedentary lifestyle. On a scale with a maximum 55 points, the mean scores were 47.4 in group A and 31.2 in group B (p=0.001). Depressive symptoms were more pronounced in group B. Twenty seven women from group A and three women from group B returned to their pre-pregnancy weight (p=0.04).

CONCLUSIONS:

Women who were physically active after delivery were characterized by higher health awareness and more frequent return to pre-pregnancy weight. Physical activity may be important for reducing the risk of postnatal depression.

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Postpartum exercise trials

- Nevertheless, several studies refer substantial **heterogeneity** of trials (based on physical exercise interventions), and point that more available data from large-scale and high-quality trials are needed to demonstrate the **effects** of exercise on postpartum **health** issues.

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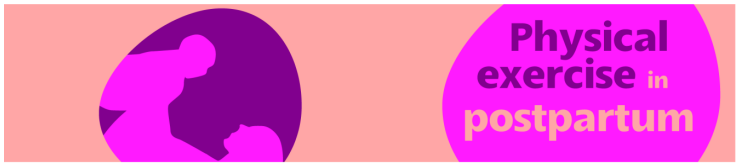

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- **POSTPARTUM STAGES**
- **POSTPARTUM BODY ADAPTATIONS**
- **BENEFITS OF PA AND EXERCISE**
- **GUIDELINES FOR PA/EXERCISE**
- **EXERCISE PRESCRIPTION**
- **EXERCISE ADAPTATIONS**

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PA / Exercise in postpartum

- Postpartum PA **guidelines** have the potential to assist women to initiate or resume PA following childbirth, so that they can transition to meeting recommended levels of PA.
  - EDUCATIONAL CONTENTS
    - Women
    - Health professionals
    - Exercise professionals

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Physical Activity following Pregnancy

- The importance of resuming PA during this time is often not made clear to women (?)
- Existing guidelines (?)

NIH Public Access
Author Manuscript
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Summary of International Guidelines for Physical Activity Following Pregnancy

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Evenson et al. (2014)

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Evenson et al. 2014

- Aim of the review: to identify and summarize guidelines for postpartum physical activity from around the world
- Methods:
  - PubMed (MedLINE) was searched for published guidelines on physical activity during the postpartum period.
  - Peer-reviewed studies published between 1990 and 2013.
  - Only the most recent country-specific public health or clinical guidelines from obstetrics, gynecology, or sports medicine (and exercise physiology) were included.
- 6 guidelines were identified from 5 countries (Australia, Canada, Norway, United Kingdom, United States).
- All guidelines were embedded within pregnancy-related physical activity (PA) recommendations.

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Evenson et al. 2014

- Most resulted from a comprehensive literature review.
- Only the Canadian guideline included a comprehensive rating of scientific evidence and a quality assessment of the evidence to support each specific recommendation.
- Majority of the guidelines:
- Health benefits of PA in PP (…)
- Ceasaraen section…
- Breastfeeding:
  - PA will not negatively affect breast milk volume, as long as there is appropriate food and fluid intake
  - PA also do not affect composition of breast milk or infant growth

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Evenson et al. 2014

- Health care providers have a critical role in encouraging women to be active at this time.
- **Guidelines lacked specificity for PA**.
- Lack of clarity around the issue of postpartum PA may lead to **inconsistent or no advice** being offered by health practitioners.
- The availability of more explicit guidelines may assist them to routinely include PA advice in their postpartum care.

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Evenson et al. 2014

- Exercise prescription
- Different positions - **resumption of PA (…) depending on delivery type and perception of confort**

- (Can) at least 15 min of aerobic exercise 3-5 d/wk (fatigue: reduce the intensity or length of exercise sessions).
- (USA) 150 min/wk of moderate intensity aerobic activity.
- Discuss with their healthcare provider how to adjust PA volume.
- (UK) return to pre-pregnancy exercise levels gradually, not resuming high impact too soon.

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Evenson et al. 2014

- Aerobic (3/6)
- Pelvic floor exercise (3/6)
  - Caution with high gravitational load on the pelvic floor (i.e., running)
- Strengthening (2/6)
- Stretching (2/6)
- Walking (2/6)

- Promising strategies include **increasing knowledge, regular counselling and support, self-monitoring** with diaries and pedometers, **increasing self-efficacy, addressing barriers, referral to community resources** for physical activity, and use of walking groups.

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Evenson et al. 2014

- Postpartum guidelines for physical activity should help women quickly achieve levels of physical activity that are commensurate with guidelines for all adults.

- It would be opportunistic for the postpartum statements to reference these adult recommendations.

Available guidelines after 2014…

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The American College of Obstetricians and Gynecologists — WOMEN'S HEALTH CARE PHYSICIANS

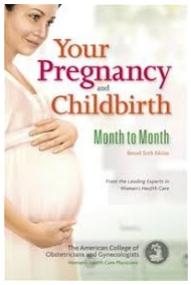
FAQ — FREQUENTLY ASKED QUESTIONS LABOR, DELIVERY, AND POSTPARTUM CARE

FAQ131, June 2015

PDF Format

Exercise After Pregnancy

- What are some of the benefits of exercise for postpartum women?



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- **Exercise After Pregnancy**
- What are some of the benefits of exercise for postpartum women?
- How much should I exercise after I have a baby?
- What is aerobic activity?
- What is moderate-intensity activity?
- What is vigorous-intensity activity?
- What are muscle-strengthening workouts and how often should I do them?
- When can I start exercising after pregnancy?
- What are some guidelines I can follow when I begin exercising after pregnancy?
- What are some ways to start exercising?
- Where can I find out about exercise classes?
- What can I do if I want to exercise but I don't want to join a gym?
- How can I stay motivated once I start exercising?
- How should I prepare for my workout?
- How should I warm up before my workout?
- How should I cool down after my workout?
- Glossary

BIRTH → PAIN → DRA

https://www.acog.org/womens-health/faqs/exercise-after-pregnancy

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What are some of the benefits of exercise for postpartum women?

Exercise has the following benefits for postpartum women:

- It helps strengthen and tone abdominal muscles.
- It boosts energy.
- It may be useful in preventing postpartum depression.
- It promotes better sleep.
- It relieves stress.

How much should I exercise after I have a baby?

After having a baby, you should get at least 150 minutes of moderate-intensity aerobic activity every week.

What is aerobic activity?

An aerobic activity is one in which you move large muscles of the body (like those in the legs and arms) in a rhythmic way.

What is moderate-intensity activity?

Moderate intensity means you are moving enough to raise your heart rate and start sweating. You can still talk normally, but you cannot sing. Examples of moderate-intensity aerobic activities include brisk walking and riding a bike on a level surface. You can choose to divide the 150 minutes into 30-minute workouts on 5 days of the week or into smaller 10-minute sessions throughout each day. For example, you could go for three 10-minute walks each day.

What is vigorous-intensity activity?

A vigorous-intensity activity is one in which it is hard to talk without pausing for breath. If you followed a vigorous-intensity exercise program before pregnancy, it may be possible to return to your regular workouts soon after the baby is born. Be sure to get your health care professional's approval.

What are muscle-strengthening workouts and how often should I do them?

This type of exercise works the body's major muscle groups, such as the legs, arms, and hips. Examples include yoga, Pilates, lifting weights, sit-ups, and push-ups. There also are special exercises (called ***Kegel exercises***) that help tone the muscles of the pelvic floor. Muscle-strengthening activities should be done in addition to your aerobic activity on at least 2 days a week.

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When can I start exercising after pregnancy?

If you had a healthy pregnancy and a normal vaginal delivery, you should be able to start exercising again soon after the baby is born. Usually, it is safe to begin exercising a few days after giving birth—or as soon as you feel ready. If you had a ***cesarean birth*** or other complications, ask your health care professional when it is safe to begin exercising again.

What are some guidelines I can follow when I begin exercising after pregnancy?

Aim to stay active for 20-30 minutes a day. When you first start exercising after childbirth, try simple postpartum exercises that help strengthen major muscle groups, including abdominal and back muscles. Gradually add moderate-intensity exercise. Remember, even 10 minutes of exercise benefits your body. If you exercised vigorously before pregnancy or you are a competitive athlete, you can work up to vigorous-intensity activity. Stop exercising if you feel pain.

What are some ways to start exercising?

When you are ready to start exercising, walking is a great way to get back in shape. Walking outside has an added bonus because you can push your baby in a stroller. There are special strollers made for this kind of activity, but using a regular stroller is fine. Another good way to get daily exercise is by joining an exercise class. Working out with a group and socializing with group members can help keep you motivated.

Where can I find out about exercise classes?

Check with your local fitness clubs or community centers for classes that interest you, such as yoga, Pilates, spinning, and dance. Some gyms even offer special postpartum exercise classes and classes you can take with your baby. You also might consider working out with a personal trainer for the first few weeks.

What can I do if I want to exercise but I don't want to join a gym?

If you do not want to join a gym but want the benefits of having someone to exercise with, ask a friend to be your workout buddy. If you want to exercise on your own, check out fitness DVDs and online exercise programs. Many are designed for women who have just had a baby. Some even show you how to involve your baby in the exercise routines.

How can I stay motivated once I start exercising?

You may already have a great exercise tool in your pocket. Smart phone apps for exercise and fitness can help you stay motivated, keep track of your progress, and connect you with others with the same exercise goals. Many apps are free or cost very little.

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How should I prepare for my workout?

As you get ready for your workout, follow these steps:

- Wear loose-fitting clothing that will help keep you cool.
- If you are breastfeeding, feed your baby or express your milk before your workout to avoid any discomfort that may come from engorged breasts.
- Wear a bra that fits well and gives plenty of support to protect your breasts.
- Have a bottle of water handy and take several sips during your workout.

How should I warm up before my workout?

Spend 10 minutes warming up to get your muscles ready for exercise. Try stretches for the lower back, pelvis, and thighs. Hold stretches for several seconds and return to the starting position. Walking in place also is a good way to warm up.

How should I cool down after my workout?

End your workout with a 5-minute cool-down period that brings your heart rate back to normal. Walk slowly in place and stretch again to help avoid soreness.

Glossary

Cesarean birth: Birth of a fetus from the uterus through an incision made in the woman's abdomen.

Kegel Exercises: Pelvic muscle exercises. Doing these exercises helps with bladder and bowel control as well as sexual function.

If you have further questions, contact your obstetrician-gynecologist.

FAQ131: This information was designed as an educational aid to patients and sets forth current information and opinions related to women's health. It is not intended as a statement of the standard of care, nor does it comprise all proper treatments or methods of care. It is not a substitute for a treating clinician's independent professional judgment. Please check for updates at www.acog.org to ensure accuracy.

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2015 ACOG – Physical Activity and Exercise During Pregnancy and the Postpartum Period

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- The American College of Obstetricians and Gynecologists (ACOG) guidelines and recommendations for exercise during pregnancy:

The American College of Obstetricians and Gynecologists
WOMEN'S HEALTH CARE PHYSICIANS

COMMITTEE OPINION

Number 650 • December 2015 *(Replaces Committee Opinion Number 267, January 2002)*

Committee on Obstetric Practice

This document reflects emerging clinical and scientific advances as of the date issued and is subject to change. The information should not be construed as dictating an exclusive course of treatment or procedure to be followed.

Physical Activity and Exercise During Pregnancy and the Postpartum Period

ABSTRACT: Physical activity in all stages of life maintains and improves cardiorespiratory fitness, reduces the risk of obesity and associated comorbidities, and results in greater longevity. Physical activity in pregnancy has minimal risks and has been shown to benefit most women, although some modification to exercise routines may

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(ACOG, 2015, 2020)

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Physical Activity and Exercise During Pregnancy and tl Postpartum Period (Withdrawn)

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December 2015

Committee Opinion No. 804

April 2020

Physical Activity and Exercise During Pregnancy and the Postpartum Period

Activity restriction should not be prescribed routinely as a treatment to reduce preterm birth. ... engaged in vigorous-intensity aerobic **activity** or who were **physically active** before pregnancy can continue these ... **Physical** inactivity is the fourth-leading risk factor for early mortality worldwide 2. ... Some women are capable of resuming **physical activities** within days of delivery.

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Three important guidelines were supported by ACOG, in 2015:

- *Exercise routines may be resumed gradually after pregnancy as soon as medically safe, depending on the mode of delivery, vaginal or cesarean, and the presence or absence of medical or surgical complications. In the absence of medical or surgical complications, rapid resumption of these activities has not been found to result in adverse effects. Some women are capable of resuming physical activities within days of delivery*.
- *Pelvic floor exercises could be initiated in the immediate postpartum period.*
- *Regular aerobic exercise in lactating women has been shown to improve maternal cardiovascular fitness without affecting milk production, composition, or infant growth. Nursing women should consider feeding their infants before exercising in order to avoid exercise discomfort of engorged breast.*

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SMA 2017

- Women should seek guidance from their health care provider before they begin or recommence their physical activity/exercise regime.
- In general, all healthy women should aim (through gradual progression) to accumulate 150-300 minutes of moderate-vigorous intensity aerobic exercise per week.
- Return to high impact activities or those that cause high gravitational load on the pelvic floor should occur gradually, and in consideration of recovery to any damage to the pelvic floor and abdominal muscles, which will vary according to the mode of delivery.
- Moderate to vigorous intensity physical activity/exercise and sports will not negatively affect breast milk volume, as long as there is appropriate food and fluid intake (the caloric cost of breast feeding is estimated to be about 600 kcal/day). This type of exercise or physical activity has also been shown not to affect the composition of breast milk or infant growth. However, if babies appear to be unsettled after feeding immediately after maternal exercise, mothers could feed their baby before exercise, postpone feeding to one hour after physical activity/exercise, or express milk before exercising, so that it may be used after the activity.

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IOC (2017)
Exercise in the postpartum period

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Consensus statement

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

Kari Bø,[1] Raul Artal,[2] Ruben Barakat,[3] Wendy J Brown,[4] Gregory A L Davies,[5] Michael Dooley,[6,7] Kelly R Evenson,[8] Lene A H Haakstad,[1] Bengt Kayser,[9] Tarja I Kinnunen,[10] Karin Larsén,[11] Michelle F Mottola,[12] Ingrid Nygaard,[13] Mireille van Poppel,[14] Britt Stuge,[15] Karim M Khan,[16] IOC Medical Commission[17]

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IOC 2017

- In the postpartum period, endurance training should start gradually. Low impact activities such as cross-country skiing, fast walking, low impact aerobics and step training put little pressure on the pelvic floor and can start soon after birth.
- Strength training in the postpartum period should start gradually with a 'pelvic floor muscle first' focus. Focus should also be on abdominal and back muscles.
- Strength training of the pelvic floor muscles can start directly after birth.
- Athletes may find exercise more comfortable after breast feeding. Breastfeeding athletes may also find a fitted bra with features of greater breast elevation more comfortable than a standard encapsulation sport bra.
- Athletes presenting with low back and pelvic girdle pain at 6 weeks postpartum should be referred to a sport/women's health physiotherapist.
- To date, there is no evidence to guide elite athletes on which abdominal exercises are the most effective in reducing the distance between the two rectus muscles and strengthening the abdominals postpartum. If the condition persists postpartum and is affecting the athlete's performance, referral for physiotherapy and/or surgical correction is indicated.

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IOC (2017)
Exercise in the postpartum period

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- Physiologic adaptations
- Breastfeeding
- Return to sports training
- Return to competition
- Depression
- Weight recovery
- Low back and pelvic pain
- DRA
- Pelvic floor dysfunction
- Sexual dysfunction

SUMMARY
This review found a limited number of studies on factors relating to return to exercise following pregnancy and childbirth in the general exercising population, and very few in elite athletes. There is also little information or evidence on which to base advice for athletes on issues relating to common complaints in the postpartum period. Both high-quality prospective cohort studies and RCTs are required. The former would be useful from a prevention viewpoint, in terms of understanding the determinants of common problems such as postnatal depression, weight retention and musculoskeletal complaints including pelvic floor disorders. More RCTs would shed light on the most effective treatment regimens for women with these problems, and would inform the advice given to athletes in terms of the optimal time to recommence training the cardiorespiratory and musculoskeletal systems.

Given the challenges of conducting studies with pregnant athletes, it would be helpful if researchers who are working on each of the main topics included in this chapter could agree on the same valid and reliable outcome measures, so that data can be pooled and treatments compared. Similarly, consensus is needed around how to assess physical activity to compare across studies. We agree with the thoughtful recommendations

Bø K, *et al*. *Br J Sports Med* 2017;**0**:1–10. doi:10.1136/bjsports-2017-097964

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IOC 2018

- Postpartum resumption of physical activity is an individualized process. Prepregnancy exercise routines may be resumed gradually, as soon as it is physically and medically safe.
- It may be prudent for athletes whose delivery was complicated by a risk factor for levator ani muscle injury (anal sphincter tear, forceps delivery, long second stage, large baby) to minimize activities that generate large increases in intra-abdominal pressure and/or repetitive high impact for several months postpartum (…) However, that there is no evidence to support this recommendation.
- Most, but not all, women will be physically recovered to begin training 4–6 weeks after surgery (caesarean section). The decision when to recommence exercise after caesarean section will be dependent on issues such as blood pressure, anemia, fatigue, pain management and wound healing.
- Once medically cleared, women may participate in both aerobic and strength training starting gradually and increasing exercise time, frequency and intensity as tolerated by their body.
- Moderate exercise during lactation does not affect the quantity or composition of breast milk or impact infant growth.
- Nursing women should consider feeding their infants (or use a breast bra) before exercising to avoid the discomfort of engorged breasts during exercise.
- Athletes may benefit from wearing a personally fitted sports bra that offers support rather than compression.
- There is no consensus on which abdominal exercises to recommend correcting diastasis recti abdominis postdelivery.
- There is strong evidence that stabilization exercises generally are not more effective than any other form of active exercise in the long term, regarding low back pain and pelvic girdle pain.
- There is strong evidence for pelvic floor muscle training as treatment of urinary incontinence in the general postpartum population.

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USDHHS 2018

- Women should do at least 150 minutes (2 hours and 30 minutes) of moderate-intensity aerobic activity a week during pregnancy and the postpartum period. Preferably, aerobic activity should be spread throughout the week.
- Women who habitually engaged in vigorous-intensity aerobic activity or who were physically active before pregnancy can continue these activities during pregnancy and the postpartum period.
- Women who are pregnant can consult their health care provider about whether or how to adjust their physical activity during pregnancy and after the baby is born.

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Guidelines for PA in Postpartum

Consensus statement

2019 Canadian guideline for physical activity throughout pregnancy

Michelle F Mottola,[1] Margie H Davenport,[2] Stephanie-May Ruchat,[3] Gregory A Davies,[4] Veronica J Poitras,[5] Casey E Gray,[6] Alejandra Jaramillo Garcia,[5] Nick Barrowman,[7] Kristi B Adamo,[8] Mary Duggan,[9] Ruben Barakat,[10] Phil Chilibeck,[11] Karen Fleming,[12] Milena Forte,[13] Jillian Korolnek,[14] Taniya Nagpal,[1] Linda G Slater,[15] Deanna Stirling,[16] Lori Zehr[17]

This joint SOCG/CSEP Clinical Practice Guideline has been prepared by the Guidelines Consensus Panel, reviewed by the Society of Obstetricians and Gynaecologists of Canada's (SOGC) Maternal Fetal Medicine and Guideline Management and Oversight Committees, and approved by the Board of the SOGC and the Board of Directors of the Canadian Society for Exercise Physiology (CSEP). This article is being copublished in the *Journal of Obstetrics and Gynaecology Canada:* English version 2018;40(11):1549-1559, https://doi.org/10.1016/j.jogc.2018.07.001; French version: 2018;40(11):1560-1570. https://doi.org/10.1016/j.jogc.2018.09.003.

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ed: first published as 10.1136/bjsports-2018-10

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ACOG 2019

- After having a baby, you should get at least 150 minutes of moderate-intensity aerobic activity every week. You can divide the 150 minutes into 30-minute workouts on 5 days of the week or into smaller 10-minute sessions throughout each day. For example, you could go for three 10-minute walks each day.
- If you had a healthy pregnancy and a normal vaginal delivery, you should be able to start exercising again soon after the baby is born. Usually, it is safe to begin exercising a few days after giving birth—or as soon as you feel ready. If you had a caesarean birth or other complications, ask your health care professional when it is safe to begin exercising again.
- Aim to stay active for 20–30 minutes a day. When you first start exercising after childbirth, try simple postpartum exercises that help strengthen major muscle groups, including abdominal and back muscles. Gradually add moderate-intensity exercise. Remember, even 10 minutes of exercise benefits your body. If you exercised vigorously before pregnancy or you are a competitive athlete, you can work up to vigorous-intensity activity. Stop exercising if you feel pain.
- When you are ready to start exercising, walking is a great way to get back in shape. Another good way to get daily exercise is by joining an exercise class.
- Check with your local fitness clubs or community centers for classes that interest you, such as yoga, Pilates, spinning, and dance. Some gyms offer special postpartum exercise classes and classes you can take with your baby. (...) If you want to exercise on your own, check out fitness videos and online exercise programs. Many are designed for women who have just had a baby.
- As you get ready for your workout, follow these steps: Wear loose-fitting clothing that will help keep you cool. If you are breastfeeding, feed your baby or express your milk before your workout to avoid any discomfort that may come from engorged breasts. Wear a bra that fits well and gives plenty of support to protect your breasts. Have a bottle of water handy and take several sips during your workout.

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ACOG 2020

- Exercise routines may be resumed gradually after pregnancy as soon as medically safe, depending on the mode of delivery (vaginal or cesarean birth) and the presence or absence of medical or surgical complications. Some women are capable of resuming physical activities within days of delivery.
- Pelvic floor exercises can be initiated in the immediate postpartum period.
- Abdominal strengthening exercises, including abdominal crunch exercises and the drawing-in exercise, a maneuver that increases abdominal pressure by pulling in the abdominal wall muscles, have been shown to decrease the incidence of diastasis recti abdominus and decrease the inter-rectus distance in women who gave birth vaginally or by cesarean birth.
- Regular aerobic exercise in lactating women has been shown to improve maternal cardiovascular fitness without affecting milk production, composition, or infant growth. Women who are lactating should consider feeding their infants or expressing milk before exercising to avoid discomfort of engorged breasts. They also should ensure adequate hydration before commencing physical activity.

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https://health.gov/moveyourway#during-after-pregnancy

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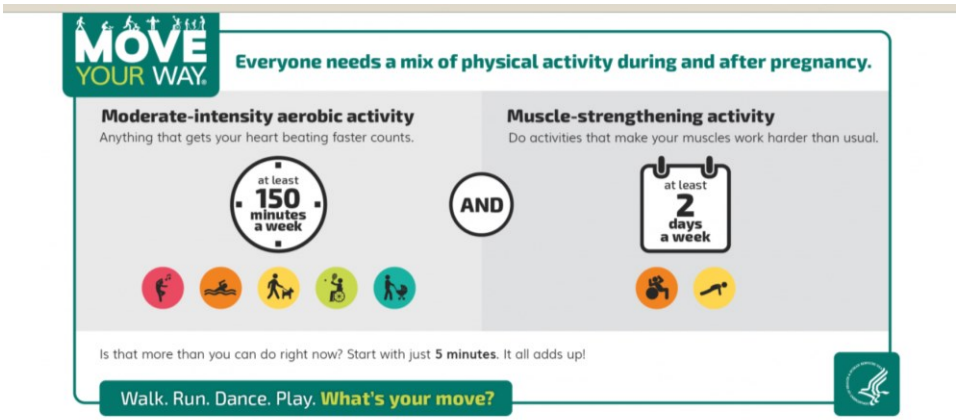

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ACSM 2020

- Pre-pregnancy Physical Activity routines can be resumed gradually as soon as physically and medically safe, which will vary depending on mode of delivery, health status and other individual factors.
- Mild Physical Activity with pelvic floor exercises and stretching should be able to be resumed immediately.
- Consult with a health care provider if there are any questions.

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AGDH 2020

- Women should do at least 150 minutes (2 hours and 30 minutes) of moderate-intensity aerobic activity a week during pregnancy and the postpartum period. Preferably, aerobic activity should be spread throughout the week.
- Women who habitually engaged in vigorous-intensity aerobic activity or who were physically active before pregnancy can continue these activities during pregnancy and the postpartum period.
- Women who are pregnant should be under the care of a health care provider who can monitor the progress of the pregnancy. Women who are pregnant can consult their health care provider about whether or how to adjust their physical activity during pregnancy and after the baby is born.
- The timing of resuming physical activity after childbirth is different for everyone. A gradual return to recommended levels of activity is generally considered safe after the six-week postnatal check with a health professional, however this may differ depending on individual circumstances.
- Try to do pelvic floor exercises every day before and during your pregnancy, and then start again as soon as possible after birth.

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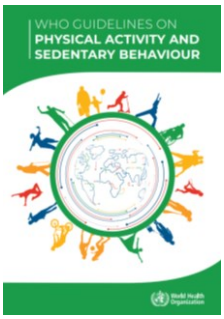
WHO 2020



It is recommended that all (pregnant and) postpartum women without contraindication should:

- Undertake regular physical activity throughout (pregnancy and) postpartum.
- Do at least 150 minutes of moderate-intensity aerobic physical activity throughout the week for substantial health benefits
- Incorporate a variety of aerobic and muscle-strengthening activities. Adding gentle stretching may also be beneficial.
- Return to physical activity gradually after delivery, and in consultation with a health-care provider, in the case of delivery by Caesarean section.
- If (pregnant and) postpartum women are not meeting the recommendations, doing some physical activity will benefit their health.
- (Pregnant and) postpartum women should start by doing small amounts of physical activity, and gradually increase frequency, intensity and duration over time.
- (Pregnant and) postpartum women should limit the amount of time spent being sedentary.
- There was no reason to alter the amount or frequency of recommended moderate-intensity physical activity for (pregnant and) postpartum women compared with the general adult population.

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Guidelines for PA in Postpartum

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Posicionamento

SBC Sociedade Brasileira de Cardiologia 1943

Posicionamento sobre Exercícios Físicos na Gestação e no Pós-Parto – 2021

Position Statement on Exercise During Pregnancy and the Post-Partum Period – 2021

Realização: Departamento de Ergometria, Exercício, Cardiologia Nuclear e Reabilitação Cardiovascular (DERC) da Sociedade Brasileira de Cardiologia (SBC), Grupo de Estudos de Cardiologia do Esporte (GECESP), Comissão DERC Mulher – Saúde e Diagnóstico das Doenças Cardiovasculares nas Mulheres e Grupo de Estudos de Reabilitação Cardiopulmonar e Metabólica (GERCPM)

Conselho de Normatizações e Diretrizes (2020-2021): Brivaldo Markman Filho, Antonio Carlos Sobral Sousa, Aurora Felice Castro Issa, Bruno Ramos Nascimento, Harry Correa Filho, Marcelo Luiz Campos Vieira

Coordenador de Normatizações e Diretrizes (2020-2021): Brivaldo Markman Filho

Autores do Posicionamento: *Milena dos Santos Barros Campos,[1,2] Susimeire Buglia[3,4] Cléa Simone Sabino de Souza Colombo,[4,5] Rica Dodo Delmar Buchler,[3,6] Adriana Soares Xavier de Brito,[7,8] Carolina Christianini Mizzaci,[1] Roberta Helena Fernandes Feitosa,[9,10] Danielle Batista Leite,[11,12] Carlos Alberto Cordeiro Hossri,[3,4] Lorena Christine Araújo de Albuquerque,[4] Odilon Gariglio Alvarenga de Freitas,[13] Gabriel Blacher Grossman,[14,15] Luiz Eduardo Mastrocola[4]*

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SBC 2021

- The postpartum exercise routine should gradually return to normal as soon as it is safe, which depends on the type of delivery (vaginal or cesarean) and whether there were surgical complications.
- It is recommended that exercise begin again approximately 6 weeks after cesarean delivery and 4 weeks after vaginal delivery. Progression should be slower if there is discomfort or other relevant factors, such as anemia or wound infection.
- Patients who exercised regularly prior to delivery should reduce the intensity in the first few months postpartum and progress gradually.
- Breastfeeding women can perform mild- to moderate-intensity aerobic exercise without damaging milk production or the growth of the child. Ideally, exercise should be performed after breastfeeding to avoid the discomfort of engorged breasts and should include adequate support.
- Resistance exercises are allowed, but care should be taken not to involve trunk flexion (traditional abdominal exercises), due to the risk of increased diastasis in the rectus abdominis muscles.
- Pilates, a suitable option for training deep abdominal muscles and the pelvic floor, can help return the woman's body to its pre-gestational state.
- Pelvic muscle training should be initiated during pregnancy.
- Jumping exercises should be avoided in the postpartum period due to the fragility of the pelvic floor.

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RANZCOG 2021

- Pelvic floor exercises can help prevent UI (at least 25 repetitions at various times of the day).
- A balanced diet and gentle exercise will help improve the strength and tone of the stomach muscles.
- In case of diastasis recti, women should be referred to a physiotherapist who will advise of some postnatal exercises and support garments that will help bring these muscles back together.
- In general, women can start exercising four to six weeks after the birth. However, they should check with a doctor before start exercising, especially if they had a caesarean section. Before this time though, women should try to get outside, take walks, or keep blood moving with a gentle workout.

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Guidelines for PA in Postpartum

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Review

Australian guidelines for physical activity in pregnancy and postpartum

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ABSTRACT

Objectives: To develop Australian guidelines on physical activity/exercise during pregnancy and the postpartum period.
Design: Critical 'umbrella' reviews of the scientific evidence, combined with adaptation of recently published guidelines.
Methods: A five stage approach included: identification of key source documents (including national physical activity/exercise guidelines and position statements from professional organisations, published since 2010); narrative review of evidence relating to 27 health outcomes; summarising the evidence; development of draft guidelines and supporting information; and review and consultation to finalise the guidelines.
Results: Our evidence review found that physical activity/exercise during pregnancy and the postpartum period is safe, has health benefits for the woman and her unborn child, and may reduce the risks of some pregnancy related complications. Four specific guidelines were developed. These encourage all women without pregnancy complications to: (1) meet the Australian Physical Activity and Sedentary Behaviour Guidelines for Adults before,

These Guidelines provide evidence-based best practice recommendations on PA/exercise during pregnancy for Australian women and those who provide healthcare during pregnancy, including health professionals, as well as coaches, trainers and fitness/recreation professionals who may be asked for advice about PA/exercise during pregnancy.
They may be used to correct myths and misconceptions about PA/exercise during pregnancy and to improve the quality of information provided to women by health and exercise professionals. (…)

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Australian 2022

- Physical activity/exercise during pregnancy and the postpartum period is safe, has health benefits for the woman and her unborn child, and reduces the risks of some pregnancy related complications.
- 1 All women without contraindications should be encouraged to meet the Australian Physical Activity and Sedentary Behaviour Guidelines for Adults before, during and after pregnancy.
- 2 Modifications to physical activity/exercise may be required to accommodate the physical changes that occur as the pregnancy progresses. If there are any concerns (including warning signs and contraindications), women are advised to seek advice from a qualified health professional.
- 3 All pregnant women are advised to do pelvic floor exercises during and after pregnancy.
- 4 Health professionals should support women to take an active role in shared decision-making about their physical activity/exercise during and after pregnancy. All health professionals who provide care during pregnancy should be familiar with contraindications, signs and symptoms which suggest that physical activity/exercise should be modified or avoided.

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Guidelines for PA in Postpartum (main topics)

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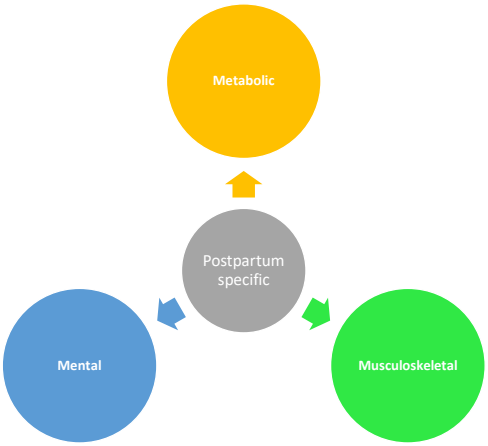
- Early postpartum (0-6 weeks) / late postpartum (6/8 weeks - …)
- Start gradually / progression
- Low-impact (walking)
- Pelvic floor muscle training (UI)
- Back and abdominal muscles
- Posture / functional / stretching
- Injuries / pain / (tears) damage
- Breastfeeding
- DRA
- Weight retention
- Type II Diabetes
- Depression / anxiety / stress



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General recommendations for physical activity in the postpartum period

(references in chapter 10 Springer)

- Women should undertake regular physical activity throughout (pregnancy and) postpartum [27].
- There was no reason to alter the amount or frequency of recommended moderate-intensity physical activity for (pregnant and) postpartum women compared with the general adult population [27].
- Women should do at least 150 minutes of moderate-intensity aerobic physical activity throughout the week for substantial health benefits, incorporating a variety of aerobic and muscle-strengthening activities. Adding gentle stretching may also be beneficial [27].
- (Pregnant and) postpartum women should start by doing small amounts of physical activity, and gradually increase frequency, intensity, and duration over time [27].
- If (pregnant and) postpartum women are not meeting the recommendations, doing some physical activity will benefit their health [27]. Even 10 minutes of exercise benefits the body [33].
- Women should stop exercising if they feel pain [33].

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Breastfeeding

BREASTFEEDING

- Regular aerobic exercise in lactating women has been shown to improve maternal cardiovascular fitness [34].
- Mild- to moderate-intensity exercise during lactation does not affect the quantity or composition of breast milk or impact infant growth [4, 26, 34, 38], as long as there is appropriate food and fluid intake (the caloric cost of breast feeding is estimated to be about 600 kcal/day) [4].
- Nursing women may find exercise more comfortable after breast feeding, to avoid the discomfort of engorged breasts during exercise [4, 26, 31, 33, 34, 38].
- Mothers could feed their baby before exercise, postpone feeding to one hour after physical activity/exercise, or express milk before exercising, so that it may be used after the activity [4].

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Bra and sportswear

- Women should wear a bra that fits well and gives plenty of support to protect the breasts [33, 38].
- Breastfeeding women may find wearing a fitted bra with features of greater breast elevation more comfortable than a standard encapsulation sport bra (or compression) [26, 31].
- Women should wear loose-fitting clothing that will help keep them cool [33].

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LBP / PGP

- There is strong evidence that stabilization exercises generally are not more effective than any other form of active exercise in the long term, regarding low back pain and pelvic girdle pain [26].
- Women presenting with low back and pelvic girdle pain at 6 weeks postpartum should be referred to a sport/women's health physiotherapist [31].

Coulombe BJ, Games KE, Neil ER, Eberman LE. Core Stability Exercise Versus General Exercise for Chronic Low Back Pain. J Athl Train. 2017 Jan;52(1):71-72. doi: 10.4085/1062-6050-51.11.16. Epub 2016 Nov 16. PMID: 27849389; PMCID: PMC5293521.

Ín the short term, core stability exercise was more effective than general exercise for decreasing pain and increasing back-specific functional status in patients with LBP.

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DRA

- To date, there is no evidence to guide women on which abdominal exercises are the most effective in reducing the distance between the two rectus muscles and strengthening the abdominals postpartum [26, 31]. If the condition persists postpartum, referral for physiotherapy and/or surgical correction is indicated [31].
- In case of diastasis recti, women should be referred to a physiotherapist who will advise of some postnatal exercises and support garments that will help bring these muscles back together [37].

Thabet AA, Alshehri MA. Efficacy of deep core stability exercise program in postpartum women with diastasis recti abdominis: a randomised controlled trial. J Musculoskelet Neuronal Interact. 2019 Mar 1;19(1):62-68. PMID: 30839304; PMCID: PMC6454249.

The deep core stability exercise program is effective in treating diastasis recti and improving postpartum women's quality of life.

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Other issues

- Women should ensure adequate hydration before commencing physical activity [34].
- Women should have a bottle of water handy and take several sips during the workout [33].
- Women should be referred to a nutritionist to prescribe an adequate diet to this period, taking into account breastfeeding and the volume of physical activity.

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Other issues

- **Women should check with local fitness clubs or community centers for (group exercise) classes that interest them. Some gyms offer special postpartum exercise classes and classes where they can take with the baby. If women prefer to exercise on their own, they should check out fitness videos and online exercise programs designed for postpartum women [33].**
- (Pregnant and) postpartum women should limit the amount of time spent being sedentary. [27]

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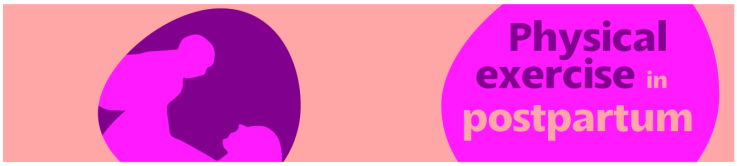

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- POSTPARTUM STAGES
- POSTPARTUM BODY ADAPTATIONS
- BENEFITS OF PA AND EXERCISE
- GUIDELINES FOR PA/EXERCISE
- EXERCISE PRESCRIPTION
- EXERCISE ADAPTATIONS

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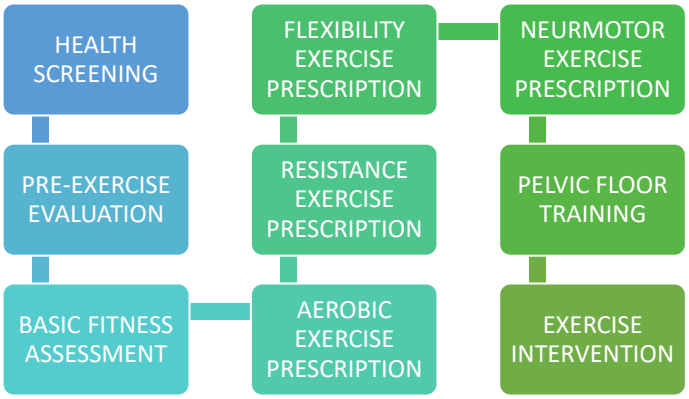
Exercise Testing and Prescription During Postpartum



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Exercise in postpartum

- The postpartum exercise routine it's an individual process.
- It should gradually return to normal as soon as it is safe, which depends on the type of delivery and whether there were surgical complications. Nevertheless, some women are capable of resuming physical activities within days of delivery.
- In the absence of medical or surgical complications, rapid resumption of exercise activities has not been found to result in adverse effects.
- However, despite the benefits, the majority of women do not resume their pre-pregnancy physical activity levels after the birth…

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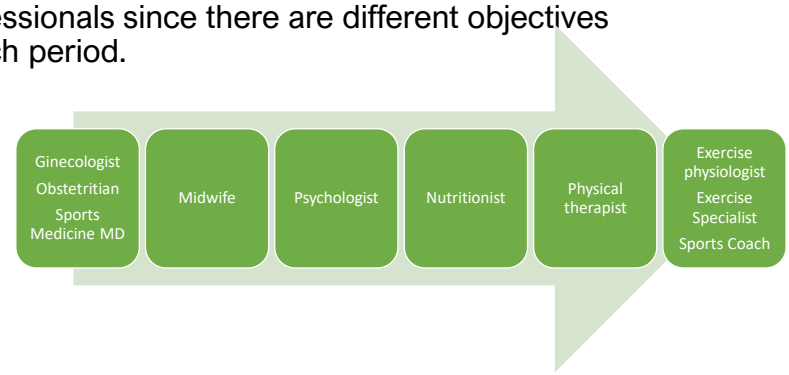
Multidisciplinary team

- In this line, **health and exercise professionals** must take into consideration different phases of the postpartum period, with specific objectives and exercise selection needs.
- Thus, there is the need for a **multidisciplinary** approach regarding exercise and health professionals since there are different objectives regarding exercise in each period.



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Health screening and pre-exercise assessment

Stage
- 1st, 2nd, 3rd trimester
- **Immediate, Early Postpartum (4th trimester), Late Postpartum**

Adaptations
- Pregnancy-related **body adaptations** (anatomy, physiology, biomechanics, BC,..)
- Pregnancy-related **symptoms** (discomforts) maintained in postpartum???

Health
- Healthy … **Clinical conditions** (diabetes, obesity, low back pain, etc.)
- Absence of relative / absolute contraindications

PA level
- Inactive - Active
- Very active - Athlete

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Health screening

- Women should seek guidance from their health care provider before they begin or recommence their physical activity/exercise regime [4, 32, 35, 36].
- Return to physical activity gradually after delivery, and in consultation with a health-care provider, in the case of delivery by Caesarean section and whether there were surgical complications [27, 33, 38].
- Progression should be slower if there is discomfort or other relevant factors, such as anemia or wound infection [33, 34, 37, 38].
- Postpartum resumption of physical activity is an individualized process [36]. Prepregnancy exercise routines may be resumed gradually, as soon as it is physically and medically safe [26, 33, 35, 36], which will vary depending on mode of delivery, health status and other individual factors [35].
- The decision when to recommence exercise after caesarean section will be dependent on issues such as blood pressure, anemia, fatigue, pain management and wound healing [26].
- Before this time though, women should try to get outside, take walks, or keep blood moving with a gentle workout [37]. Mild exercises should be able to be resumed immediately [33, 35].

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The RANZCOG recommendations on when a postpartum woman should contact a doctor or midwife:

Your doctor or midwife will want to see you for a postnatal checkup two to six weeks after the birth of your baby. Contact your doctor or midwife earlier, if you notice any of the following:

- *Heavy clotting or bleeding*
- *Offensive smell*
- *High temperature or fever*
- *Pain, tenderness or warmth in your calf or thigh, particularly when you flex your foot*
- *A lump or hardened area in your breast*
- *Redness, heat or oozing from your stitches*
- *Depression that affects your ability to cope and does not subside after a few day*

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Contraindications to exercise in postpartum

- PAIN / INJURY / MUSCLE DAMAGE
- EXCESSIVE FATIGUE
- DISCONFORT (e.g. vaginal veins, episiotomy, water exercise, etc.)
- POP (high impact exercise)
- Severe diastasis recti (??)

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Pregnancy-related adaptations and impact of exercise (by trimester)

Anatomical and physiological changes
- Circulatory system (blood, breathing, metabolic)
- Locomotion system (coordination, balance)
- Endocrine system and hormonal changes
- Weight gain

Body biomechanics
- Changes in the curvatures of the spine
- Altered range of joint motion
- Shifting the centre of gravity
- Locomotion system (gait)

Psychological changes
- Anxiety
- Depression
- Stress

This requires verification of the selected exercises and modification of their techniques, as well as increased supervision for safety reasons.

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Pre-exercise assessment:

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- The stages of the postpartum period
- The type of birth and its impacts on musculoskeletal health (e.g., UI, pelvic girdle pain, low back pain)
- The common pains and discomforts during postpartum, and its implications for exercise adaptation (e.g., running, water exercise, and cycling)
- Diastasis recti and exercise modalities requiring the intervention of a physiotherapist
- Low back pain and exercise selection, that may require the intervention of a physiotherapist
- Pelvic floor training, which requires the intervention of a physiotherapist or an exercise physiologist
- Lactation and exercise adaptation, that may require the intervention of a midwife
- The infant's mobility, sleeping, and feeding practices
- Women's motivations
- Perception of health and quality of life
- Social support

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Birth / mode of delivery

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- Vaginal (normal)
- Instruments
- C-section

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- Outpatient postpartum recovery is an underexplored area of obstetrics. There is currently no consensus regarding which patient-reported outcome measure (PROM) clinicians and researchers should use to evaluate postpartum recovery.
- The best-performing PROMs currently available to evaluate outpatient postpartum recovery were the Maternal Concerns Questionnaire, the Postpartum Quality of Life tool, and the World Health Organization Quality of Life-BREF; however, these tools all had significant limitations. This study highlights the need to focus future efforts on robustly developing and validating a new PROM that may comprehensively evaluate outpatient postpartum recovery.

Original Investigation | Obstetrics and Gynecology

May 27, 2021

Use of Patient-Reported Outcome Measures to Assess Outpatient Postpartum Recovery

A Systematic Review

Pervez Sultan, MBChB, MD(Res)[1]; Nadir Sharawi, MBBS, MSc[2]; Lindsay Blake, MLIS[3]; et al

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The hospital-based period

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- The hospital-based period is very limited regarding exercise, and women are very focused on the baby.
- However, simple exercises to stimulate cardiorespiratory system and improve the blood flow in particular muscles groups can be performed while **walking** through the hospital corridors or laying in bed.
- Some **postural** and light **stretching** exercises are also possible.
- **Pelvic floor muscle training** can be implemented anytime.

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The early postpartum = "4th trimester"

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- Many of the physical and physiological changes that occur during pregnancy will persist for four to six weeks after delivery. Although the timing for recovery will be **different for each woman**, it will cover the immediate postpartum and, normally, until the first 6 weeks of the later postpartum.
- Regarding physical activity and exercise, we call this stage the "early postpartum" or the "fourth trimester", assuming that, between the third and the sixth months after delivery, the woman will be able to resume normal physical activity and exercise.
- PELVIC ORGANS
- MUSCULO-SKELETAL STRUCTURES (joint pain, diastasis recti, laxity, …)
- BREASTFEEDING
- MENTAL HEALTH

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The later postpartum

- The later postpartum, which duration can vary regarding breastfeeding and body recovery, is a transition stage to “normal” life.

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2020 PAR-Q+

The Physical Activity Readiness Questionnaire for Everyone

The health benefits of regular physical activity are clear; more people should engage in physical activity every day of the week. Participating in physical activity is very safe for MOST people. This questionnaire will tell you whether it is necessary for you to seek further advice from your doctor OR a qualified exercise professional before becoming more physically active.

GENERAL HEALTH QUESTIONS

Please read the 7 questions below carefully and answer each one honestly: check YES or NO.	YES	NO
1) Has your doctor ever said that you have a heart condition ☐ **OR** high blood pressure ☐?	☐	☐
2) Do you feel pain in your chest at rest, during your daily activities of living, **OR** when you do physical activity?	☐	☐
3) Do you lose balance because of dizziness **OR** have you lost consciousness in the last 12 months? Please answer **NO** if your dizziness was associated with over-breathing (including during vigorous exercise).	☐	☐
4) Have you ever been diagnosed with another chronic medical condition (other than heart disease or high blood pressure)? **PLEASE LIST CONDITION(S) HERE:** _____	☐	☐
5) Are you currently taking prescribed medications for a chronic medical condition? **PLEASE LIST CONDITION(S) AND MEDICATIONS HERE:** _____	☐	☐
6) Do you currently have (or have had within the past 12 months) a bone, joint, or soft tissue (muscle, ligament, or tendon) problem that could be made worse by becoming more physically active? Please answer **NO** if you had a problem in the past, but it **does not limit your current ability** to be physically active. **PLEASE LIST CONDITION(S) HERE:** _____	☐	☐
7) Has your doctor ever said that you should only do medically supervised physical activity?	☐	☐

If you answered NO to all of the questions above, you are cleared for physical activity.
Please sign the PARTICIPANT DECLARATION. You do not need to complete Pages 2 and 3.

- Start becoming much more physically active – start slowly and build up gradually.
- Follow Global Physical Activity Guidelines for your age (https://apps.who.int/iris/handle/10665/94399).
- You may take part in a health and fitness appraisal.
- If you are over the age of 45 yr and NOT accustomed to regular vigorous to maximal effort exercise, consult a qualified exercise professional before engaging in this intensity of exercise.
- If you have any further questions, contact a qualified exercise professional.

PARTICIPANT DECLARATION
If you are less than the legal age required for consent or require the assent of a care provider, your parent, guardian or care provider must also sign this form.

I, the undersigned, have read, understood to my full satisfaction and completed this questionnaire. I acknowledge that this physical activity clearance is valid for a maximum of 12 months from the date it is completed and becomes invalid if my condition changes. I also acknowledge that the community/fitness center may retain a copy of this form for its records. In these instances, it will maintain the confidentiality of the same, complying with applicable law.

NAME _____ DATE _____
SIGNATURE _____ WITNESS _____
SIGNATURE OF PARENT/GUARDIAN/CARE PROVIDER _____

If you answered YES to one or more of the questions above, COMPLETE PAGES 2 AND 3.

Delay becoming more active if:

- You have a temporary illness such as a cold or fever; it is best to wait until you feel better.
- You are pregnant - talk to your health care practitioner, your physician, a qualified exercise professional, and/or complete the eMAMAQ 35 at www.eparmedx.com before becoming more physically active.
- Your health changes - answer the questions on Pages 2 and 3 of this document and/or talk to your doctor or a qualified exercise professional before continuing with any physical activity program.

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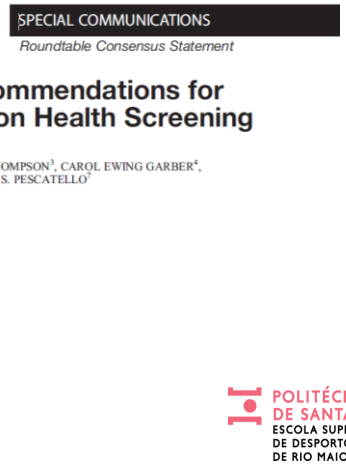
01-11-2019

Online (updated) resources:
http://eparmedx.com/



SPECIAL COMMUNICATIONS
Roundtable Consensus Statement

Updating ACSM’s Recommendations for Exercise Preparticipation Health Screening

DEBORAH RIEBE[1], BARRY A. FRANKLIN[2], PAUL D. THOMPSON[3], CAROL EWING GARBER[4], GEOFFREY P. WHITFIELD[5], MEIR MAGAL[6], and LINDA S. PESCATELLO[7]

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Preexercise evaluation – CVD risk factors 2021

TABLE 2.2 • Cardiovascular Disease (CVD) Risk Factors and Defining Criteria

Positive Risk Factors[a]	Defining Criteria
Age	Men ≥45 yr; women ≥55 yr (36)
Family history	Myocardial infarction, coronary revascularization, or sudden death before 55 yr in father or other male first-degree relative or before 65 yr in mother or other female first-degree relative (37)
Cigarette smoking	Current cigarette smoker or those who quit within the previous 6 mo or exposure to environmental tobacco smoke (37,38)
Physical inactivity	Not meeting the minimum threshold of 500–1,000 MET-min of moderate-to-vigorous physical activity or 75–150 min · wk^{-1} of moderate-to-vigorous intensity physical activity (23)
Body mass index/waist circumference	Body mass index ≥30 kg · m^{-2} or waist girth >102 cm (40 in) for men and >88 cm (38 in) for women (39)
Blood pressure	Systolic blood pressure ≥130 mm Hg and/or diastolic ≥80 mm Hg, based on an average of ≥2 readings obtained on ≥2 occasions, or on antihypertensive medication (40)
Lipids	Low-density lipoprotein cholesterol (LDL-C) ≥130 mg · dL^{-1} (3.37 mmol · L^{-1}) or high-density lipoprotein cholesterol (HDL-C) <40 mg · dL^{-1} (1.04 mmol · L^{-1}) in men and <50 mg · dL^{-1} (1.30 mmol · L^{-1}) in women or non-HDL-C <130 (3.37 mmol · L^{-1}) or on lipid-lowering medication. If total serum cholesterol is all that is available, use ≥200 mg · dL^{-1} (5.18 mmol · L^{-1}) (41).
Blood glucose	Fasting plasma glucose ≥100 mg · dL^{-1} (5.5 mmol · L^{-1}); or 2 h plasma glucose values in oral glucose tolerance test (OGTT) ≥140 mg · dL^{-1} (7.77 mmol · L^{-1}); or HbA1C ≥5.7% (42)
Negative Risk Factors	**Defining Criteria**
HDL-C[b]	≥60 mg · dL^{-1} (1.55 mmol · L^{-1}) (41)

[a]If the presence or absence of a CVD risk factor is not disclosed or is not available, that CVD risk factor should be counted as a risk factor.
[b]High HDL-C is considered a negative risk factor. For individuals having high HDL ≥60 mg · dL^{-1} (1.55 mmol · L^{-1}), one positive risk factor is subtracted from the sum of positive risk factors.
HbA1C, glycated hemoglobin; MET, metabolic equivalent; non-HDL-C, total cholesterol minus HDL-C.

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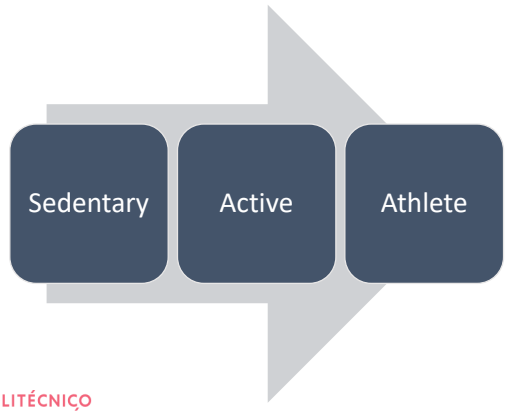
PA volume
Exercise skills



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PPAQ / IPAQ /GPAQ

Epidemiology

Development and Validation of a Pregnancy Physical Activity Questionnaire

LISA CHASAN-TABER[1], MICHAEL D. SCHMIDT[1], DAWN E. ROBERTS[2], DAVID HOSMER[1], GLENN MARKENSON[3], and PATTY S. FREEDSON[2]

[1]*Department of Biostatistics & Epidemiology, School of Public Health & Health Sciences, University of Massachusetts, Amherst, MA;* [2]*Department of Exercise Science, School of Public Health & Health Sciences, University of Massachusetts, Amherst, MA;* [3]*Baystate Medical Center, Springfield, MA.*

ABSTRACT

CHASAN-TABER, L., M. D. SCHMIDT, D. E. ROBERTS, D. HOSMER, G. MARKENSON, and P. S. FREEDSON. Development and Validation of a Pregnancy Physical Activity Questionnaire. *Med. Sci. Sports Exerc.*, Vol. 16, No. 10, pp. 1750–1760, 2004.
Purpose: The effect of physical activity during pregnancy on maternal and fetal health remains controversial and studies have yet to identify the optimal dose of physical activity associated with favorable pregnancy outcomes. The aim of this study was to develop and validate a pregnancy physical activity questionnaire (PPAQ). **Methods:** To ascertain the type, duration, and frequency of physical activities performed by pregnant women, three 24-h physical activity recalls were administered to 235 ethnically diverse prenatal care patients at a large tertiary care facility in western Massachusetts. The relative contribution of each activity to between-person variance in energy expenditure was used to establish the list of activities for the PPAQ. The PPAQ is self-administered and asks respondents to report the time spent participating in 32 activities including household/caregiving, occupational, sports/exercise, transportation, and inactivity. To validate the PPAQ, 54 pregnant women completed the PPAQ and then wore a Manufacturing Technology, Inc. actigraph for the following 7 d. At the end of the 7-d period, the PPAQ was repeated. **Results:** Intraclass correlation coefficients used to measure reproducibility of the PPAQ were 0.78 for total activity, 0.87 for moderate activity, 0.81 for vigorous activity, and ranged from 0.81

J Phys Act Health. 2009 Nov;6(6):790-804. doi: 10.1123/jpah.6.6.790.

Global physical activity questionnaire (GPAQ): nine country reliability and validity study

Fiona C Bull [1], Tahlia S Maslin, Timothy Armstrong

Affiliations + expand

PMID: 20101923 DOI: 10.1123/jpah.6.6.790

Abstract

Purpose: Instruments to assess physical activity are needed for (inter)national surveillance systems

Sanda et al. *BMC Sports Science, Medicine and Rehabilitation* (2017) 9:7
DOI 10.1186/s13102-017-0070-4

BMC Sports Science, Medicine and Rehabilitation

RESEARCH ARTICLE Open Access

Reliability and concurrent validity of the International Physical Activity Questionnaire short form among pregnant women

Birgitte Sanda[1,2*], Ingvild Vistad[2], Lene Annette Hagen Haakstad[3], Sveinung Berntsen[1], Linda Reme Sagedal[2], Hilde Lohne-Seiler[1] and Monica Klungland Torstveit[1]

Abstract: Sanda B, Vistad I, Haakstad LAH, Berntsen S, Sagedal LR, Lohne-Seiler H, Torstveit MK. Reliability and concurrent validity of the International Physical Activity Questionnaire short form among pregnant women.
Background: The International Physical Activity Questionnaire short-form (IPAQ-SF) is frequently used to assess physical activity (PA) level in the general adult population including pregnant women. However, the reliability and validity of the questionnaire in pregnancy is unknown. Therefore, the aims of the present study were to investigate test-retest reliability and concurrent validity of IPAQ-SF among pregnant women, and whether PA is reported differently among those who fulfill (active) vs. do not fulfill (inactive) recommendations of ≥150 min of weekly

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Review

Sports Med. 2004;34(1):1-8. doi: 10.2165/00007256-200434010-00001.

How many steps/day are enough? Preliminary pedometer indices for public health

Catrine Tudor-Locke [1], David R Bassett Jr

Affiliations + expand

PMID: 14715035 DOI: 10.2165/00007256-200434010-00001

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Research article | Open Access | Published: 11 August 2015

Associations between neighbourhood walkability and daily steps in adults: a systematic review and meta-analysis

Samantha Hajna, Nancy A. Ross, Anne-Sophie Brazeau, Patrick Bélisle, Lawrence Joseph & Kaberi Dasgupta

BMC Public Health **15**, Article number: 768 (2015) | Cite this article

5343 Accesses | **92** Citations | **9** Altmetric | Metrics

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Med Sci Sports Exerc. Author manuscript; available in PMC 2022 January 01.

Published in final edited form as:
Med Sci Sports Exerc. 2021 January ; 53(1): 165–173. doi:10.1249/MSS.0000000000002430.

Development of a Cadence-Based Metabolic Equation for Walking

Christopher C. Moore[1,*], Elroy J. Aguiar[2], Scott W. Ducharme[3], Catrine Tudor-Locke[4]
[1]Department of Epidemiology, University of North Carolina at Chapel Hill, Chapel Hill, NC
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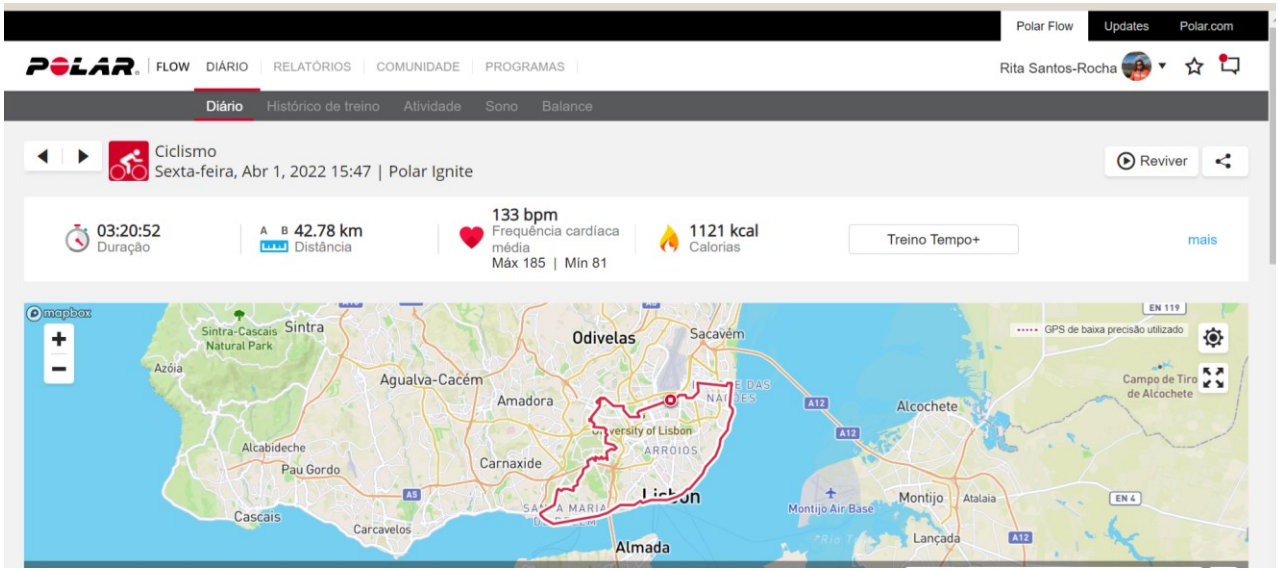

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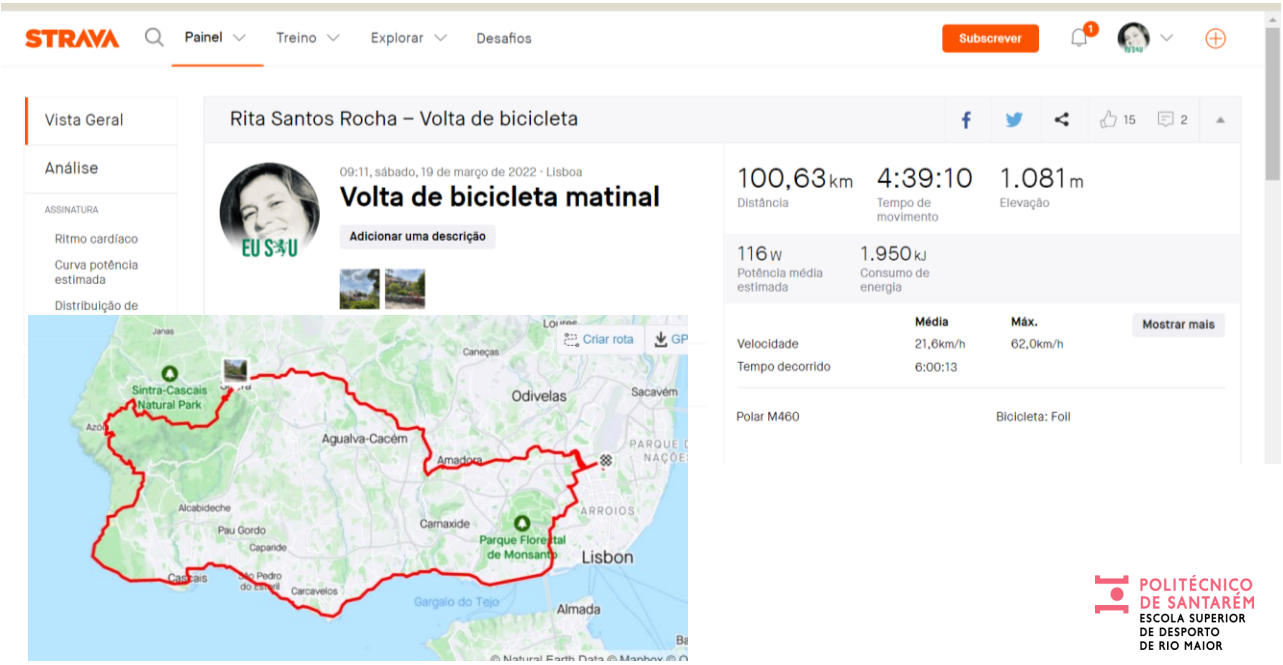

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WALKING

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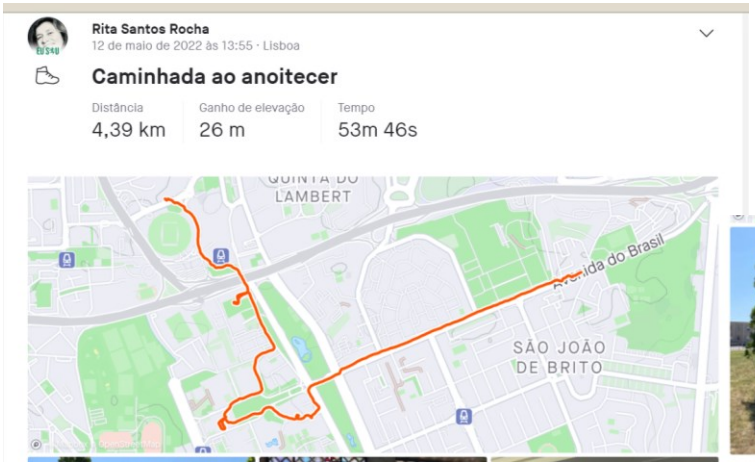

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Exercise testing in postpartum ?????

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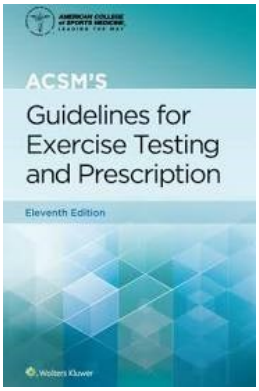
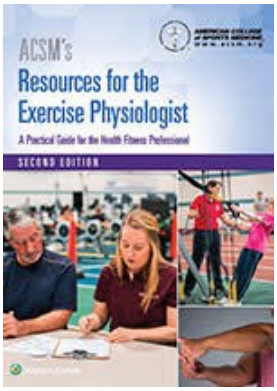
POSTURAL ASSESSMENT
FUNCTIONAL ASSESSMENT





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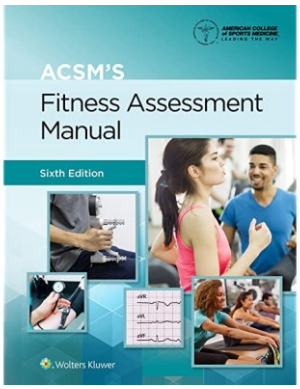
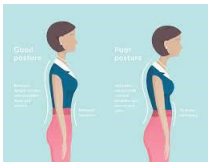
Postural assessment

Postural assessment is an important tool which can be used **to assess the reasons behind various injuries in sports persons**, since repetitive loading of body caused by sports activities leads to certain postural alterations, which can ultimately cause pain and injury.

Postural assessment entails **observation of static posture for alignment and visual and palpable assessment of paired anatomic landmarks for symmetry.**

The patient is instructed to stand still, with feet shoulder-width apart, face forward, and arms relaxed to the sides.





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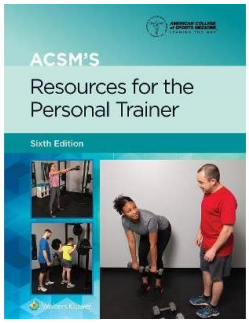
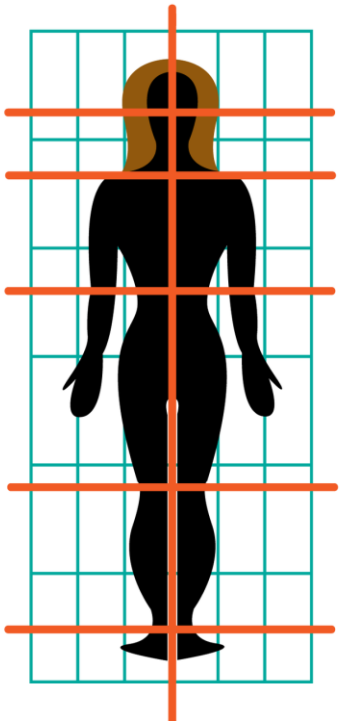
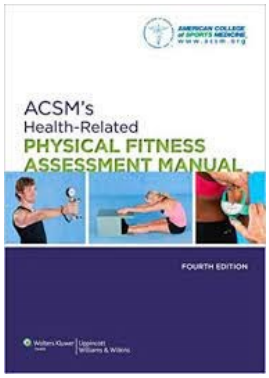
Postural Assessment:

ANTERIOR VIEW







O R I G Y M

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Exercise testing in postpartum

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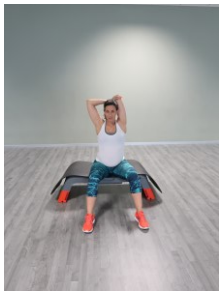
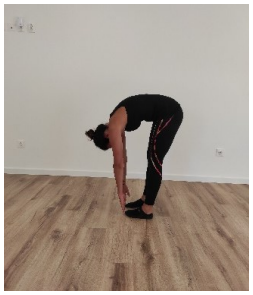
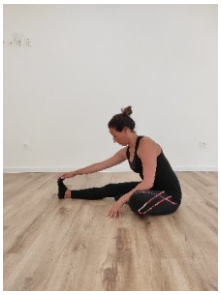
- Functional capacity refers to **the capability of performing tasks and activities that people find necessary or desirable in their lives**.
- Flexibility
- Resistance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Exercise testing in postpartum

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- **Cardiorespiratory – walking test**
- Enright PL. The six-minute walk test. Respir Care. 2003 Aug;48(8):783-5. PMID: 12890299.
- **6MWD = (2.11 x height_cm) - (2.29 x weight_kg) - (5.78 x age) + 667 m**
- Enright PL, Sherrill DL. Reference equations for the six-minute walk in healthy adults. Am J Respir Crit Care Med. 1998 Nov;158(5 Pt 1):1384-7. doi: 10.1164/ajrccm.158.5.9710086. Erratum in: Am J Respir Crit Care Med. 2020 Feb 1;201(3):393. PMID: 9817683.
- The prediction equation achieved was **VO2 max (ml.min-1) = -3672.585 + (966.472 × Sex [1: female, 2: male]) + (-18.492 X RhR [beats.minute-1]) + (9.191 X Distance [m]) + (87.707 × BMI).** The R2 of the equation was 0.91 ($p < 0.01$).
- Vásquez-Gómez J, Castillo-Retamal M, Faundez-Casanova C, Carvalho RS, Ramírez-Campillo R, Valdés-Badilla P. Ecuación para predecir el consumo máximo de oxígeno a partir de la prueba de caminata de seis minutos en jóvenes sanos [An equation to predict maximum oxygen consumption from the six-minute walk test in healthy young adults]. Rev Med Chil. 2018 Jul;146(7):830-838. Spanish. doi: 10.4067/s0034-98872018000700830. PMID: 30534881.
- Rockport One-Mile Fitness Walking Test: **VO_{2max} (mL/kg/min) = 132.853 – (0.1692 x body mass in kg) – (0.3877 x age in years) - (3.2649 x time in min) – (0.1565 x HR)**

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VO_2 max_women_mL/kg/min

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	20-29 years	30-39 years	40-49 years
Superior	56.0	45.8	41.7
Excelent	46.5 – 51.3	37.5 – 41.4	34.0 – 38.4
Good	40.6 – 44.7	32.2 – 36.1	28.7 – 32.4
Fair	34.6 - 38.9	28.2 – 31.2	24.9 – 27.7
Poor	28.6 – 33.6	24.1 – 27.4	21.3 – 24.1

Fitness level
Metabolic equations (intensity)
Exercise prescription (intensity)
Caloric expenditure

ACSM-GETP11, table 3.8

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Cardiorespiratory fitness (heart rate reserve)

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HR max = 207 - (0.7 x age) beats/min (Gellish et al. 2007)

HR max = 192 – (0.007 x age^2) beats/min (Gellish et al. 2007)

HR = pulse palpation (for 30 or 60 s), or heart rate monitor

HR rest

Gross VO2 tr = (VO2max – VO2rest) x int + VO2rest (ml/kg/min)

Net VO2 tr = (VO2max – VO2rest) x int (ml/kg/min) energy expenditure (1 LO2 ~ 5 kcal)

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Cardiorespiratory fitness (VO2)

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Gross VO2 reserve method (training) = (VO2max – VO2rest) x int + VO2rest (ml/kg/min)

- Training target zones
- Metabolic calculations
  - VO2 walking (50-100 m/min) = (0.1 x speed) + (1.8 x speed x % grade) + 3.5 (ml/kg/min)
  - VO2 running (134 m/min) = (0.2 x speed) + (0.9 x speed x % grade) + 3.5 (ml/kg/min)
  - VO2 cycling (50-200 W / 300-1200 kg.m/min) = [(1.8 x work rate)/body mass (kg)] + 7

Net VO2 tr = (VO2max – VO2rest) x int (ml/kg/min)

- Exercise volume = product of frequency, intensity, and duration of exercise (target: 500 - 1,000 MET-min/week)
- Energy expenditure (1 LO2 ~ 5 kcal/min)

ACSM-GETP11 (2021)

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Borg scale / heart rate / talk test

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Consensus statement

Table 3 Heart rate ranges for pregnant women

Maternal age	Intensity	Heart rate range (beats/min)
<29	Light	102–124
	Moderate	125–146
	Vigorous	147–169*
30+	Light	101–120
	Moderate	121–141
	Vigorous	142–162*

Moderate-intensity physical activity (40%–59% heart rate reserve (HRR)); vigorous-intensity physical activity (60%–80% HRR).
Target heart rate ranges were derived from peak exercise tests in medically screened, low-risk pregnant women.[26 27]
*As there is minimal information regarding the impact of physical activity at the upper end of the vigorous-intensity heart rate ranges, women wishing to be active at this intensity (or beyond) are encouraged to consult their obstetric care provider.

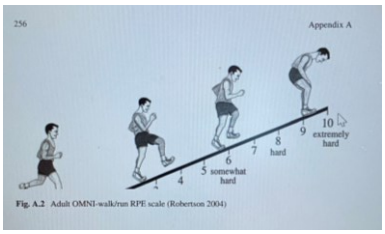

Fig. A.2 Adult OMNI-walk/run RPE scale (Robertson 2004)

Table 1. The 15-Grade Scale for Ratings of Perceived Exertion ⇦

6	
7	Very, very light
8	
9	Very light
10	
11	Fairly light
12	
13	Somewhat hard
14	
15	Hard
16	
17	Very hard
18	
19	Very, very hard
20	

Reprinted from Borg GA. Psychophysical bases of perceived exertion. Med Sci Sports Exerc 1982;14:377–81.

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Exercise prescription in postpartum

AEROBIC EXERCISE

- Exercise routines should incorporate a **variety of aerobic activities** [27]; exercises that activate large muscle groups in a rhythmic and continuous fashion. A variety of weight-bearing activities are well tolerated during the postpartum period.
- Women who habitually engaged in vigorous-intensity aerobic activity or who were physically active before pregnancy can continue these activities during pregnancy and the postpartum period [32,36].]. If the woman exercised vigorously before pregnancy or she is a competitive athlete, she can work up to vigorous-intensity activity [33].
- Aerobic exercise should start gradually [26, 31, 33], and increasing exercise time, frequency and intensity as tolerated by their body [26].
- In general, all healthy women should aim (through gradual progression) to accumulate 150-300 minutes of moderate-vigorous intensity aerobic exercise per week [4, 27, 32, 33, 36]. Moderate intensity exercise refers to 3-5.9 METs; RPE = 12-13; 40%-60% $VO_{2reserve}$
- Preferably, aerobic activity should be spread throughout the week [27, 32, 36]. The 150 minutes can be divided into 30-minute workouts on 5 days of the week or into smaller 10-minute sessions throughout each day (e.g., three 10-minute walks each day) [33]
- Low impact activities such as cross-country skiing, fast walking, low impact aerobics and step training put little pressure on the pelvic floor and can start soon after birth [31]. Walking and joining an exercise class (e.g., spinning and dance) are good ways to get daily exercise and get back in shape [33].
- It may be prudent for women whose delivery was complicated by a risk factor for levator ani muscle injury (anal sphincter tear, forceps delivery, long second stage, large baby) **to minimize activities that generate repetitive high impact** for several months postpartum [26].
- Return to high impact activities or those that cause high gravitational load on the pelvic floor should occur gradually, and in consideration of recovery to any damage to the pelvic floor and abdominal muscles, which will vary according to the mode of delivery [4].
- Activities with risk of fall and trauma should be avoided. Activities that require jumping movements and quick changes in direction which can stress joints should be done with caution to minimize the risk of joint injury.

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Exercise prescription in postpartum

RESISTANCE / STRENGTH EXERCISE

- **Exercise routines should incorporate a variety of muscle-strengthening activities** [27].
- A variety of machines, free weights, and body weight exercises are well tolerated during the postpartum period.
- Strength exercise should start gradually [26, 31], and increasing exercise time, frequency and intensity as tolerated by their body [26].
- Intensity that permits multiple submaximal repetitions (i.e., 8-10 or 12-15 repetitions) to be performed to the point of moderate fatigue (40%-60% of estimated one repetition maximum).
- First focus should be on **abdominal and back muscles** [31, 33].
- It may be prudent for women whose delivery was complicated by a risk factor for levator ani muscle injury (anal sphincter tear, forceps delivery, long second stage, large baby) to minimize activities that generate large increases in intra-abdominal pressure for several months postpartum [26].
- Abdominal strengthening exercises, including abdominal crunch exercises and the drawing-in exercise, a maneuver that increases abdominal pressure by pulling in the abdominal wall muscles, have been shown to decrease the incidence of diastasis recti abdominus and decrease the inter-rectus distance in women who gave birth vaginally or by cesarean birth [34].
- A balanced diet and gentle exercise will help improve the strength and tone of the stomach muscles [37].
- **Pilates**, a suitable option for training deep abdominal muscles and the pelvic floor, can help return the woman's body to its pre-gestational state [38].

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Exercise prescription in postpartum

PELVIC FLOOR MUSCLES TRAINING

- Complex training for pelvic-floor muscles should be focused both on their contraction and relaxation. Different exercises should be performed to improve pelvic floor muscle speed, strength, endurance and muscular coordination, and engaging both fast and slow twitch muscle fibers.
- Proper technique should be ensured.
- There is strong evidence for pelvic floor muscle training as prevention and treatment of urinary incontinence in the general postpartum population [26, 37].
- Pelvic floor muscles training should be performed during pregnancy, and can start directly after birth [31, 34, 35, 36, 38], at least 25 repetitions at various times of the day [37].
- An effective intensity (and volume) of pelvic floor muscles exercise has not been determined, but it can be performed 10-30 min/day, 1-7 days/week.
- Pelvic floor muscles training can be performed anywhere, anytime, every day.
- Jumping exercises should be avoided in the postpartum period due to the fragility of the pelvic floor [38].

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Exercise prescription in postpartum

STRETCHING EXERCISE

- Adding gentle stretching to exercise routines may also be beneficial [27].
- Stretching exercises should be able to be resumed immediately [35].
- A series of active or passive static and dynamic flexibility exercises for each muscle-tendon unit should be performed.
- Stretch to the point of feeling tightness or slight discomfort, holding static stretch for 10-30 s (up to 60 s); 2-4 repetitions of each exercise; at least 2-3 up to 7 days / week.
- Excessive joint stress should be avoided until more data is available.

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Exercise prescription in postpartum

BALANCE AND COORDINATION EXERCISE

- Exercises involving motor skill, e.g., balance, agility, coordination, gait), proprioceptive training, and multifaceted activities (e.g., Pilates, Yoga, tai chi) are well tolerated during the postpartum period.
- Joining an exercise class (e.g., yoga, and Pilates) is a good way to get daily exercise and get back in shape [33].
- Balance and/or coordination exercises can be included in daily activities (e.g., functional training).
- Intensity in balance or coordination training refers to the degree of difficulty of the postures, movements, or routines practiced. An effective intensity (and volume) of neuromotor exercise has not been determined, but it can be performed 20-30 to 60 min/day, at least 2-3 up to 7 days/week.
- Positions and movements that are uncomfortable or likely to result in loss of balance and falling should be avoided.

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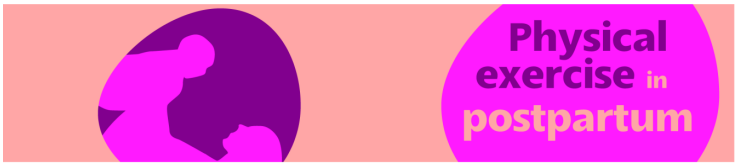

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- POSTPARTUM STAGES
- POSTPARTUM BODY ADAPTATIONS
- BENEFITS OF PA AND EXERCISE
- GUIDELINES FOR PA/EXERCISE
- EXERCISE PRESCRIPTION
- EXERCISE ADAPTATIONS

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Exercise selection in postpartum

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- Most women who have had a normal delivery and puerperium can start earlier, gradually increasing the load and intensity.
- The decision when to recommence exercise after caesarean section will be dependent on issues such as blood pressure, anemia, fatigue, pain management and wound healing
- **Some activities will be limited until pelvic organs and musculoskeletal health structures are recovered.**

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Exercise selection in postpartum

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- **Exercises to be implemented in the early postpartum, while recovering pelvic organs and musculoskeletal structures**

1-2 weeks	3-4 weeks	5-6 weeks
Walking 10-30’	Walking 10-40’	Walking 10-60’
15-30’ Posture Stretching	20-35’ Posture Core Stretching	25-40’ Posture Core Functional Stretching
PFMT	PFMT	PFMT

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Pelvic floor muscle training

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- Technique

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Pelvic floor muscle training

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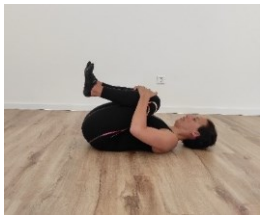

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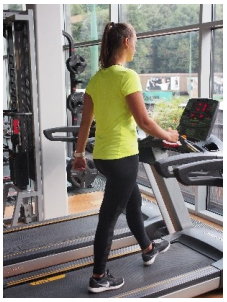
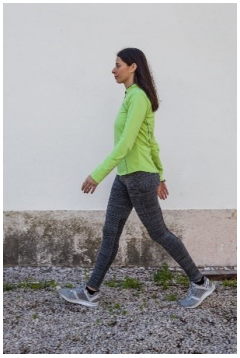
Walking

- Technique
- Experience
- Shoes
- Bra
- Outdoor





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Dancing/Aerobics

- Technique
- Experience
- Shoes
- Bra
- Low-impact

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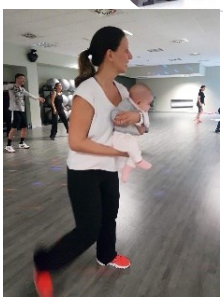
Dancing/Aerobics/Step

"Invisible step" sequences:
https://youtu.be/d3hB9B9n32Q
https://youtu.be/-uCqgy4IBi8

Step sequences:
https://youtu.be/pPvX_tpI-dI
https://youtu.be/aR3XYAnz2y8



Aerobics / dance sequences:
https://youtu.be/j-e261TkfaM
https://youtu.be/iUQQKJVIns4
https://youtu.be/8w5eOje6cmc
https://youtu.be/42cPuwrcR1g

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Pilates / Core training

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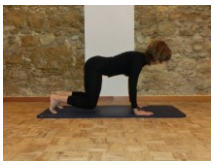
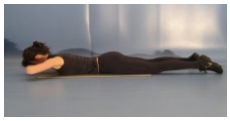
- Technique
- Body awareness





Core training sequences:

https://youtu.be/SHgBbAXSV9s

https://youtu.be/uwvYPWrIPcE

https://youtu.be/i305rPap7TE

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Posture and functional training

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- Technique








Posture training sequences:
https://youtu.be/i305rPap7TE (barre floor)
https://youtu.be/xlzgPzqV6EM (barre)
https://youtu.be/a7elvHa-s0Q (barre chair)
https://youtu.be/ilcUBX1Gmn0 (barre chair)
https://youtu.be/82CMuAlQrx0 (back)
https://youtu.be/WEyYXs3FOVc (back)

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Resistance training

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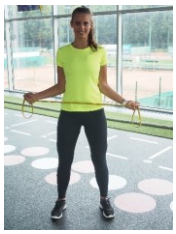
- Technique










Resistance training sequences:
https://youtu.be/XPdjFt3BuhQ (arms)
https://youtu.be/BHsjzBppQp0 (arms)
https://youtu.be/Gl1Udp38aPs (arms)
https://youtu.be/ToY0EmgPVko (outdoor arms)
https://youtu.be/02zl0rm4MLo (outdoor trunk)
https://youtu.be/--O2NR4hCWE (outdoor legs)
https://youtu.be/NTweRu7MkkE (legs)
https://youtu.be/5rlvSh46fLA (legs)
https://youtu.be/AwzoZKK_Fh8 (thighs)
https://youtu.be/O-Qyw9sbNjw (abs)
https://youtu.be/lJ_c_2ZaQv8 (abs)
https://youtu.be/KSnvPoBJzFc (abs)

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Stretching

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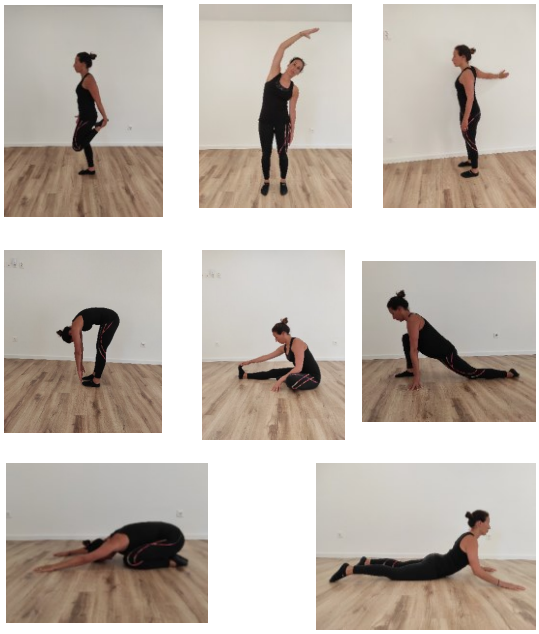
- Technique

Stretching training sequences:
https://youtu.be/2vwnucGInq0 (outdoor)
https://youtu.be/WmOP2n2IdzQ (outdoor)
https://youtu.be/m5As5GvBN3k (floor)
https://youtu.be/ZuOeA7fHN7Q (floor)
https://youtu.be/PQUVB2uVgDE (floor)
https://youtu.be/J73FgSWpyaM (chair)
https://youtu.be/EArd5cqHDKs (bench)

https://youtu.be/1nCAUoIxThE (bench)



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Balance training

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- Technique

Balance training sequences:

https://youtu.be/isX_y7AiUpE

https://youtu.be/NUQ5oJlEHtQ (yoga balance)

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Outdoor

- https://www.youtube.com/channel/UCEUWdoBeh5rgfM0kZOn9Xtg

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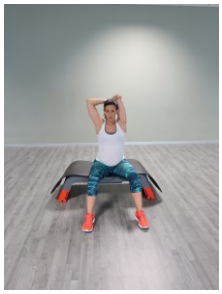
@Home

- https://www.youtube.com/channel/UCEUWdoBeh5rgfM0kZOn9Xtg



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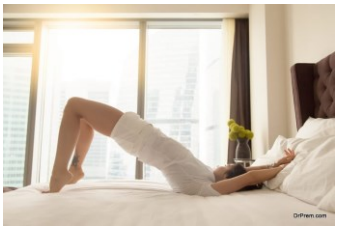
Bed exercise



Exercise PROGRESSION in postpartum

- TYPE OF EXERCISE
- POSITIONS (STANDING-LYING-SEATING-CHAIR-CAT-…)
- DURATION
- INTENSITY (CADENCE, REPETITIONS, LOAD, …)

Exercise selection in postpartum

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- **Exercises to be implemented in the late postpartum, after full recovery of pelvic organs and musculoskeletal structures**

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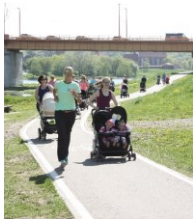
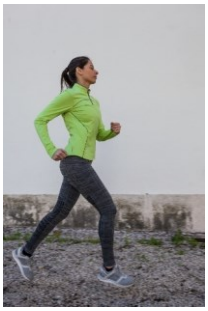
Jogging/Running

- Technique
- Experience
- Shoes
- Bra
- Outdoor





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Cycling

- Technique
- Outdoor
- Equipment
- Experience
- Safety
- Saddle
- (confort)







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Cycling






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Jumping

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Heavy strength training

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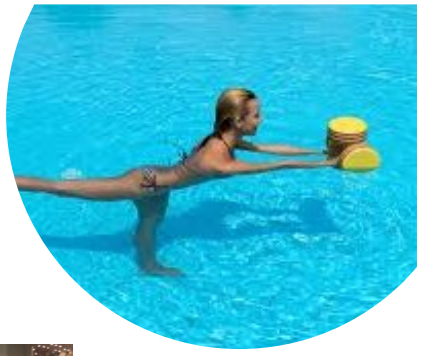
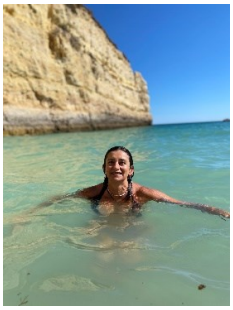
Water exercise



- Technique
- Experience



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Other forms of increasing PA

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- ✓ Starting the day with some **stretching**
- ✓ Using a pedometer and increasing the walking time to a minimum of **10,000 steps per day**
- ✓ Not standing in the same position for long periods of time
- ✓ Limiting the seating time and doing stretching pauses or **desk exercises**
- ✓ Taking the **stairs** as frequently as possible
- ✓ Engaging in **walking groups** with other mothers and babies, or with family and friends
- ✓ Walking the **dog**
- ✓ Playing with the **baby**
- ✓ Playing with other **children**
- ✓ Dancing with the **music** at home
- ✓ Taking short bouts of exercise at home (e.g., by following YouTube **videos**, or by using available apps that encourage physical activity)
- ✓ Getting all **family** involved
- ✓ Doing other forms of physical activity (e.g., housing chores, **gardening**, etc.).

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YouTube

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Active Pregnancy

Physical exercise in postpartum

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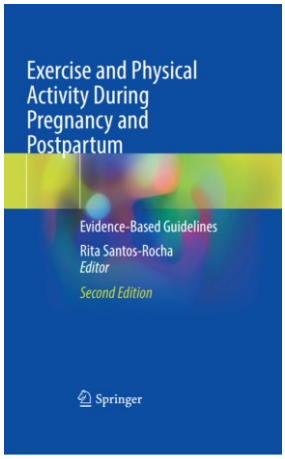
Exercise and Physical Activity During Pregnancy and Postpartum. Evidence-Based Guidelines

https://www.springer.com/gp/book/9783319910314



1 - Physical activity, exercise, and health promotion for the pregnant exerciser Mireille van Poppel, Katrine Mari Owe, Rita Santos-Rocha, Hélia Dias, and Miguel Ángel Oviedo-Caro

2 – Psychological, social, and behavioural changes during pregnancy: implications for physical activity and exercise Lou Atkinson and Megan Teychenne

3 - Physiological changes during pregnancy. Main adaptations, discomforts and implications for physical activity and exercise María Perales, Taniya Singh Nagpal, and Ruben Barakat

4 - Body composition changes during pregnancy and effects of physical exercise Nuno M. Pimenta, Frøydis Hausmann, Coral Falco, and Mireille van Poppel

5 - Biomechanical adaptations of gait in pregnancy. Implications for physical activity and exercise Marco Branco, Rita Santos-Rocha, Liliana Aguiar, Filomena Vieira, and António Prieto Veloso

6 - Specific musculoskeletal adaptations in pregnancy: pelvic floor, abdominal muscles, pelvic girdle, and lower back. Implications for physical activity and exercise Kari Bø, Britt Stuge, and Gunvor Hilde

7 - Evidence-based and practice-oriented guidelines for exercising during pregnancy Anna Szumilewicz, Aneta Worska, Rita Santos-Rocha, and Miguel Ángel Oviedo-Caro

8 - Exercise testing and prescription in pregnancy Rita Santos-Rocha, Isabel Corrales Gutiérrez, Anna Szumilewicz, and Simona Pajaujiene

9 - Exercise selection and adaptations during pregnancy Anna Szumilewicz and Rita Santos-Rocha

10 - Exercise prescription and adaptations in early postpartum Rita Santos-Rocha, Anna Szumilewicz, and Simona Pajaujiene

11 - Strengthening competences of future healthcare professionals to promote physical activity during pregnancy and post-partum Jennifer Wegrzyk, Mathilde Hyvärinen, Claire De Labrusse, and Franziska Schläppy

12 - Therapeutic Exercise regarding Musculoskeletal Health of the Pregnant Exerciser and Athlete Augusto Gil Pascoal, Britt Stuge, Patrícia Mota, Gunvor Hilde, and Kari Bø

13 - Nutritional and energy requirements of the pregnant exerciser and athlete Maria-Raquel G. Silva, and Belén Rodriguez

14 - Diet Recommendations for the Pregnant Exerciser and Athlete Rui Jorge, Diana Teixeira, Inês Ferreira, and Ana Luisa Alvarez Falcón

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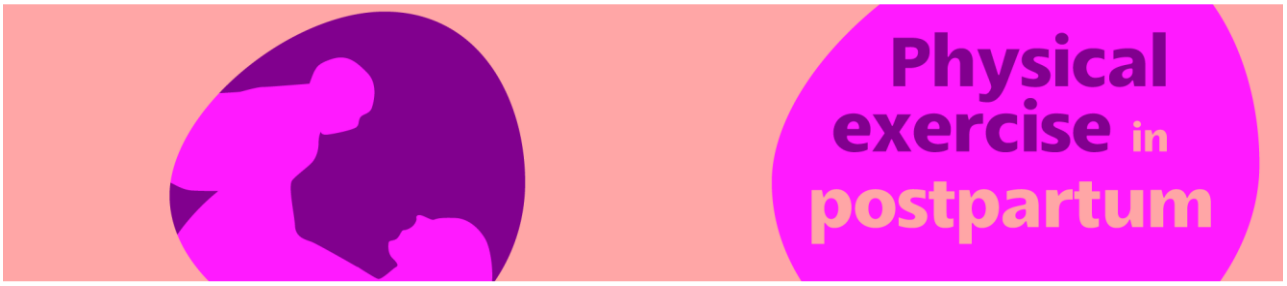

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Rita Santos Rocha

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- http://ciper.fmh.ulisboa.pt/
- https://www.youtube.com/channel/UCEUWdoBeh5rgfM0kZOn9Xtg
  - #AtivoEmCasa #AtivoArLivre ACTIVE AT HOME
- https://www.youtube.com/channel/UC0Vyookwc0mcQ5T70imtoNA
  - #GravidezAtiva ACTIVE PREGNANCY

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