



2022 NSCA PERSONAL TRAINERS VIRTUAL CONFERENCE

October 25 - 28, 2022 | ONLINE | 2.0 CEUs



Training the Postpartum Client

Evidence-based exercise recommendations and
guidelines for postpartum individuals



Presented by Stephanie Paplinskie, PhD, CSCS



Stephanie Paplinskie, MA, CSCS
*Training the Postpartum Client – Exercise Considerations
When Working with Individuals Who Have Given Birth*

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CONFLICT OF INTEREST STATEMENT

I have no actual or potential conflict of interest in relation to this presentation.

In the headlines...

WHAT TO EXPECT WHEN YOU'RE EXPECTING TO RETURN TO ELITE-LEVEL SPORT AFTER HAVING A

FEATURE STORY

Pregnancy just another challenge for elite endurance athletes

Social media allowing athletes to start com

By Josh Kozelj, in Feature story, on April 30, 2022

...facts ev
do the world's

-A competitive training during pregnancy

Health-Fitness

9 Elite Athletes Share What It's Really Like to Compete After Pregnancy

By Kate Friedman

June 8, 2017



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Learning Objectives

- Identify and describe unique markers over the postpartum period.
- Discuss the impact of physical activity (PA) and exercise (Ex) on maternal health within the one year after delivery.
- Highlight key recommendations and findings in the literature.
- Design programs for new mothers to begin or resume physical activity in the postpartum period.



Postpartum Stages

ACUTE

IMMEDIATE

LATE



**CLIENT'S
LIFESPAN**

PREGNANCY
9-10 months

POSTPARTUM

PRE-PREGNANCY?



Evenson et al., 2014

Acute Postpartum

~0-12 hours after delivery

Mother & infant health monitored:

- Post-delivery care provided
- Potential crisis/emergencies
- Breastfeeding initiated

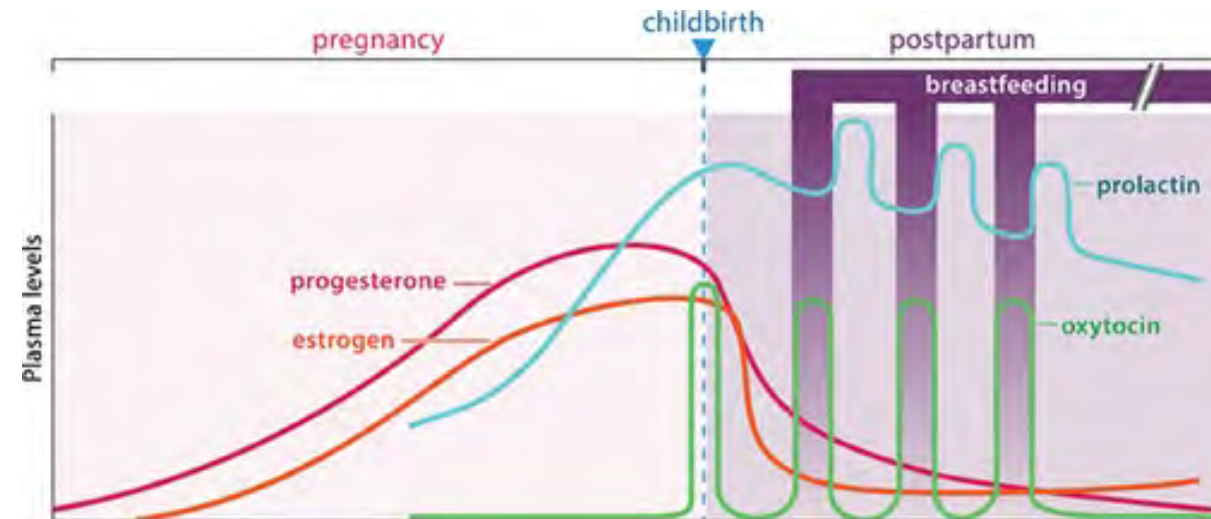


Fig.1: Sequence of hormone changes in the maternal circulation that underlie the onset of lactation in women

Kohl et al., 2017

Immediate Postpartum

12 hours to ~6 weeks

“The Fourth Trimester”

- Musculoskeletal adaptations
- Hormonal changes continue
- Mood/emotional imbalances
- 6-week postpartum check-up
- Pelvic health assessment
- PA & exercise begin/resume



Fitzgerald & Segal., 2015

Late Postpartum

~6 weeks up to 1 year

Maternal body undergoing major changes:

- Anatomical adaptations continue
- Pelvic floor rehabilitation
- Weight retention?
- PA & exercise progression
- Preparation for subsequent pregnancy/return to work/sport?



Santos-Rocha, 2022

Musculo-skeletal Adaptations

Postural changes

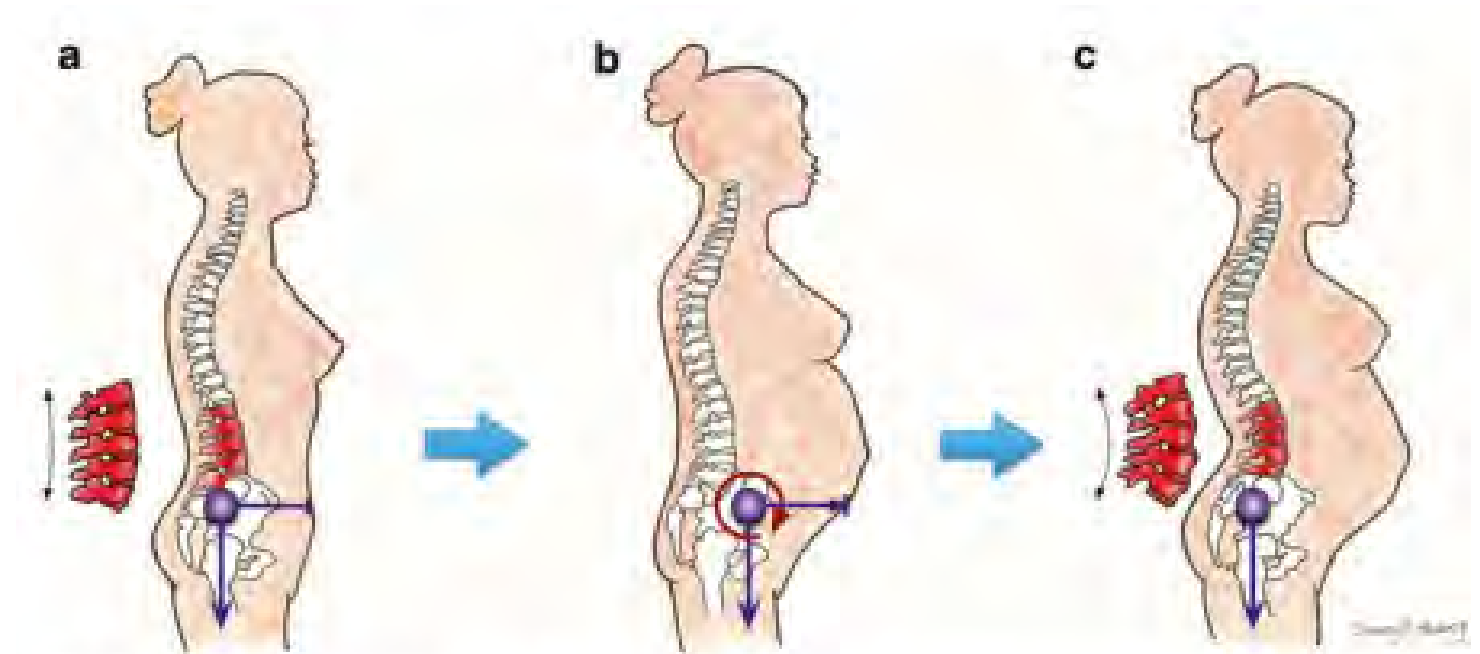


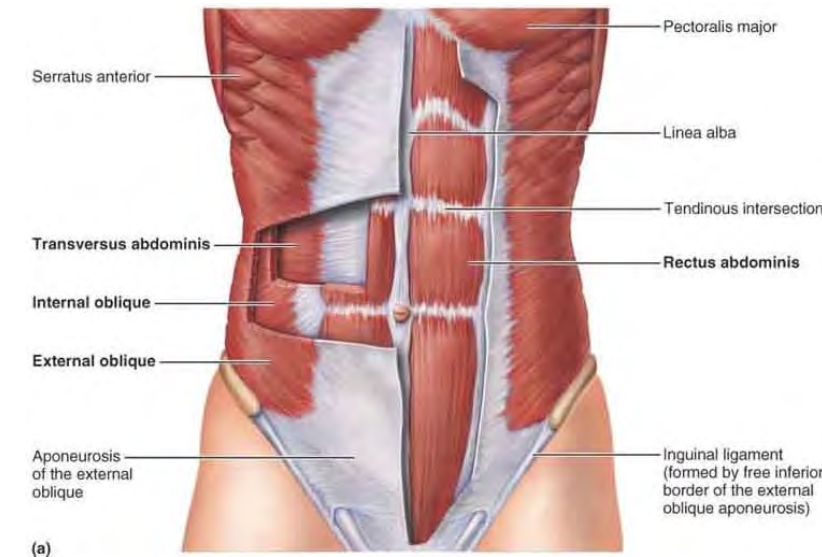
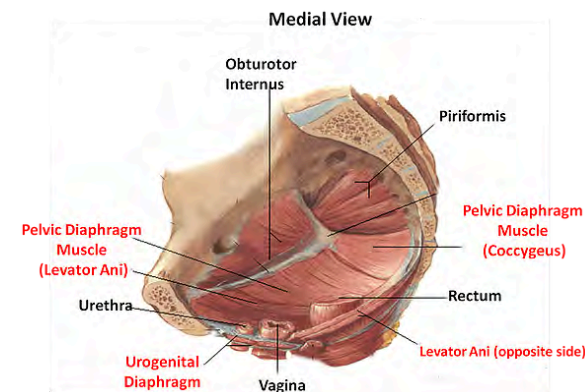
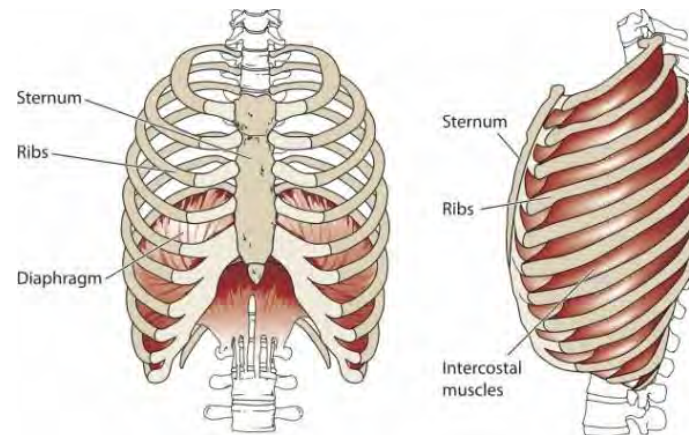
Fig. 1.1 Postural adaptations to altered center of mass: (a) normal posture; (b) anterior displacement of the center of mass lengthens the moment arm of pelvic stabilizers and increases anterior torque at the hip; (c) a compensatory increase in the lumbar lordosis shifts the center of mass back to the neutral position over or slightly posterior to the hip joint center to restore sagittal stability

Fitzgerald & Segal., 2015

Musculo-fascial Adaptations

Altered “inner core unit” structures

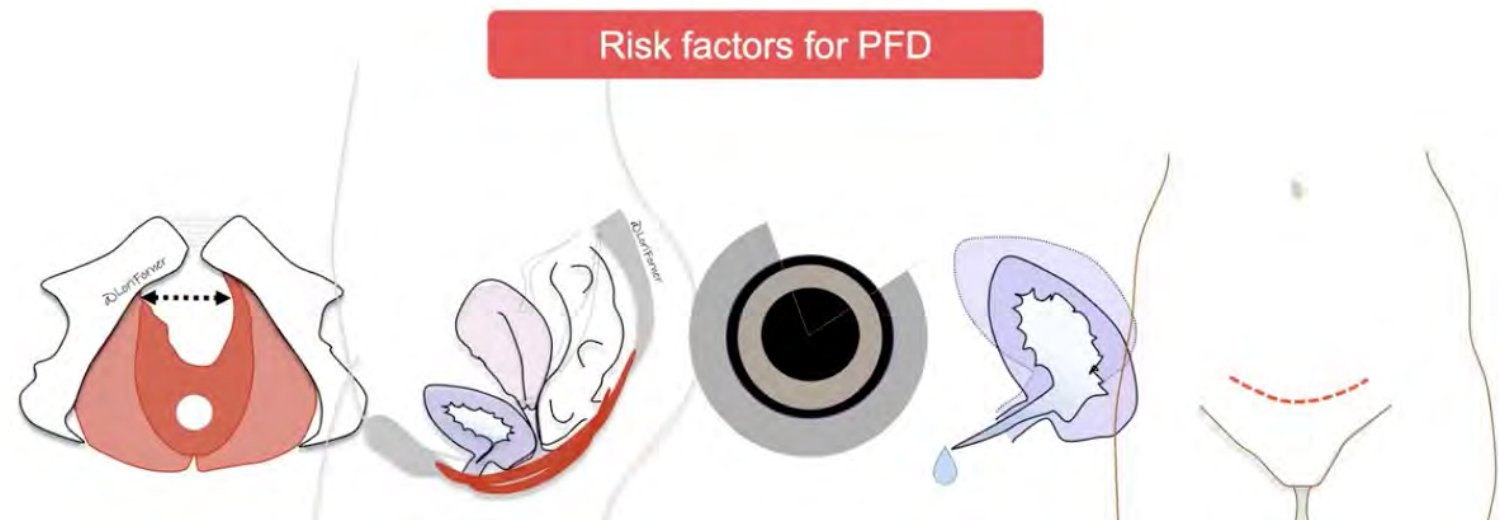
Diaphragm, transverse abdominis (TVA), pelvic floor muscles (PFM)



Musculo-skeletal Adaptations

Pelvic Floor Dysfunction

- ✓ Diastasis rectus abdominus (DRA)
- ✓ Urinary incontinence (UI)
- ✓ Pelvic organ prolapse (POP)
- ✓ Sexual dysfunction



Forner, 2021

Physiological Adaptations

Hormonal changes



Eur Spine J (2012) 21:1769–1776
DOI 10.1007/s00586-012-2162-x

REVIEW ARTICLE

Pregnancy-related pelvic girdle pain and its relationship with relaxin levels during pregnancy: a systematic review

Daniela Aldabe · Daniel Cury Ribeiro ·
Stephan Milosavljevic · Melanie Dawn Bussey



MASTERCLASS

Evidence of stabilizing exercises for low back- and pelvic girdle pain – a critical review[☆]

Britt Stuge^{*}

Brazilian Journal of Physical Therapy 2019; 23(2): 181–186

Received: 23 December 2016 | Revised: 1 October 2017 | Accepted: 10 October 2017
DOI: 10.1002/pt.1689

WILEY

RESEARCH ARTICLE

The effectiveness of stabilising exercises in pelvic girdle pain during pregnancy and after delivery: A systematic review

S. Almeida¹ | E. Lamerandier² | G. Kitsoulis³

PHYSIOTHERAPY RESEARCH INTERNATIONAL

Mood Disorders

Depression, anxiety, fatigue, body image, QoL



5 - 43 %

(population-specific)

30% ANXIETY

with PFD symptoms



Breastfeeding



6
MONTHS

exclusively,
& complimentary
for up to 2 years
(or more)



Breastfeeding and postpartum weight loss

Christina-Paulina Lambrinou, Eva Karaglanı, and Yannis Manios

Purpose of review

Postpartum weight retainment is common in women, increasing the long-term likelihood of overweight and/or obesity. On the other hand, breastfeeding entails a high energy cost that contributes to the total energy expenditure of the mother, increasing the chances of a negative energy equilibrium that could potentially lead to weight loss. This review explores this association as depicted in the latest literature available.

Recent findings

Several studies reported a positive association between breastfeeding and postpartum weight loss while others reported no significant association. Several potential mechanisms, metabolic pathways and determinants have been described.

Summary

Even though several studies support the potentially beneficial role of breastfeeding in postpartum weight loss, more studies with robust designs are needed to reach a reliable conclusion. Healthcare providers should encourage breastfeeding, not only for its health benefits for both the mother and the offspring but also for its potential role in weight loss.

Postpartum Weight Retention

Large decrease in maternal weight in first 6 weeks:

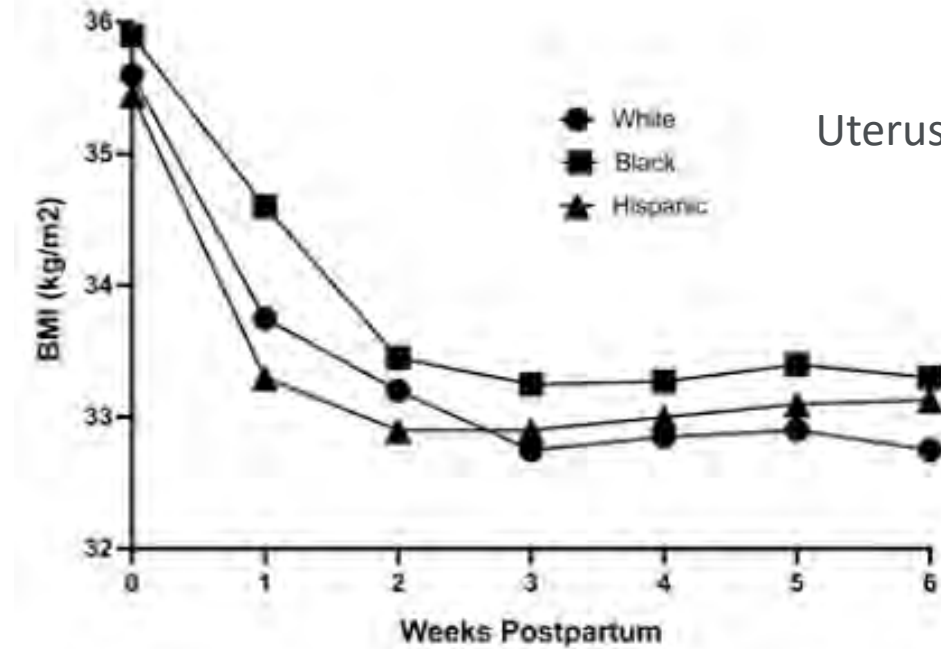
Weight of infant

Placenta

Amniotic fluid loss

Decrease blood volume

Uterus returning to normal size

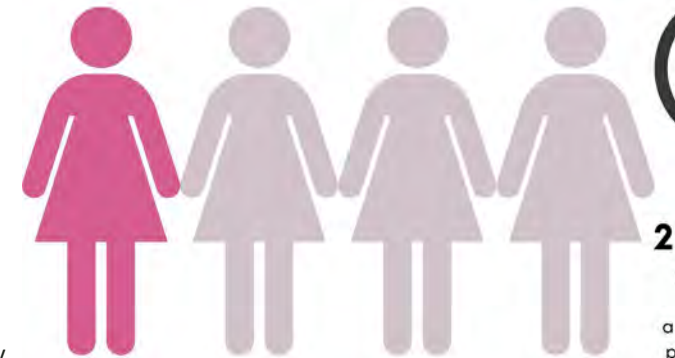
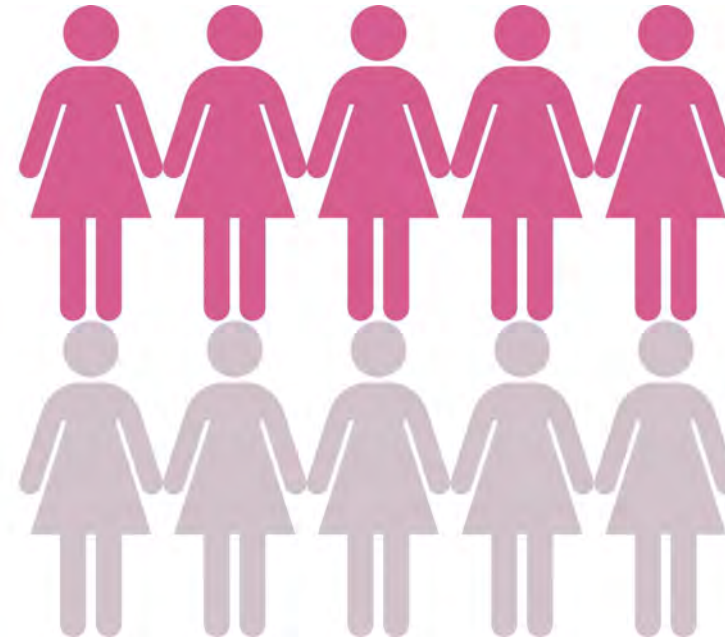


Walker et al., 2006

Postpartum Weight Retention



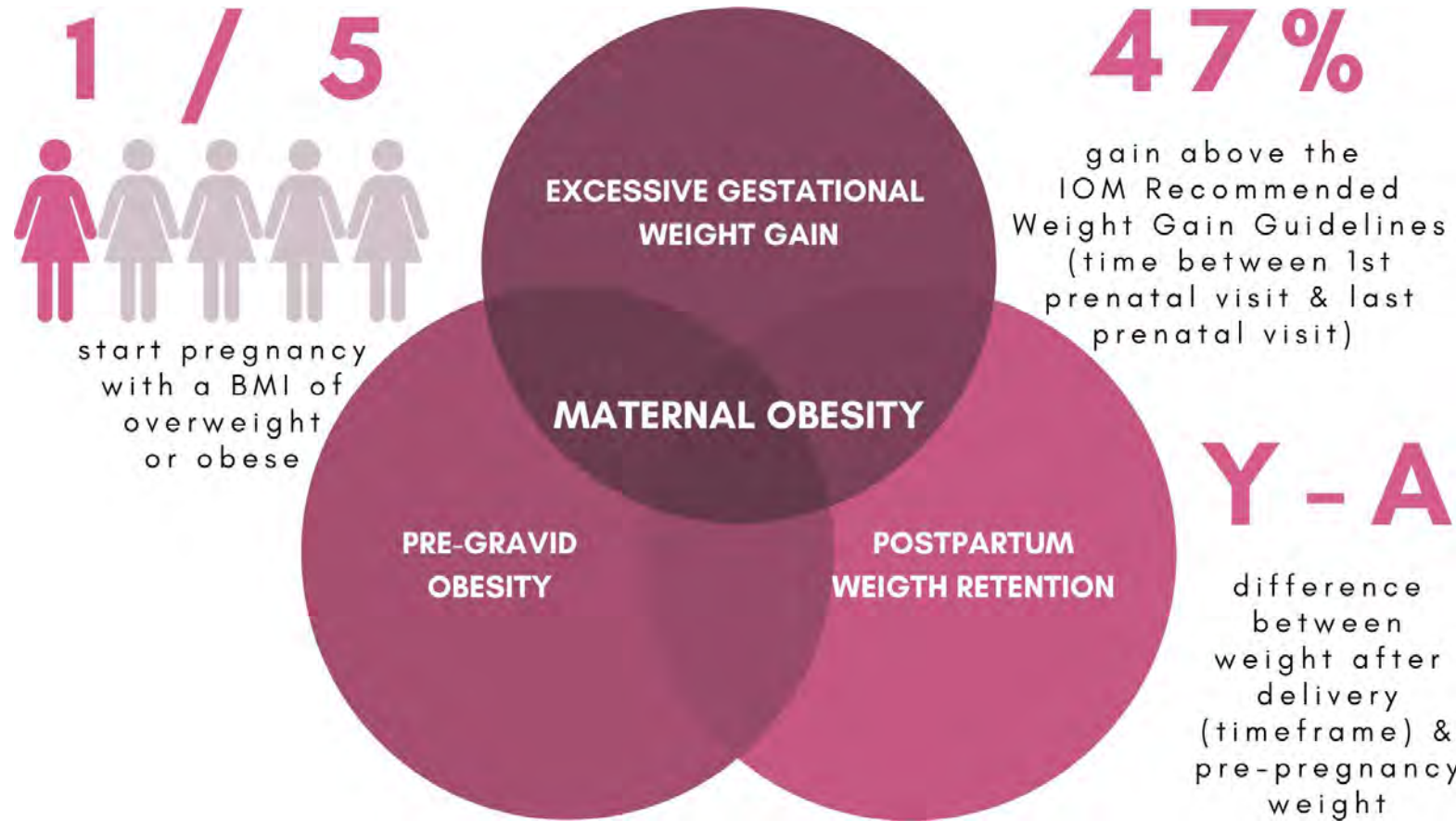
**10 LBS /
4.5 KGS**
at 6 months
postpartum



**20 LBS /
9 KGS**
at 6 months
postpartum

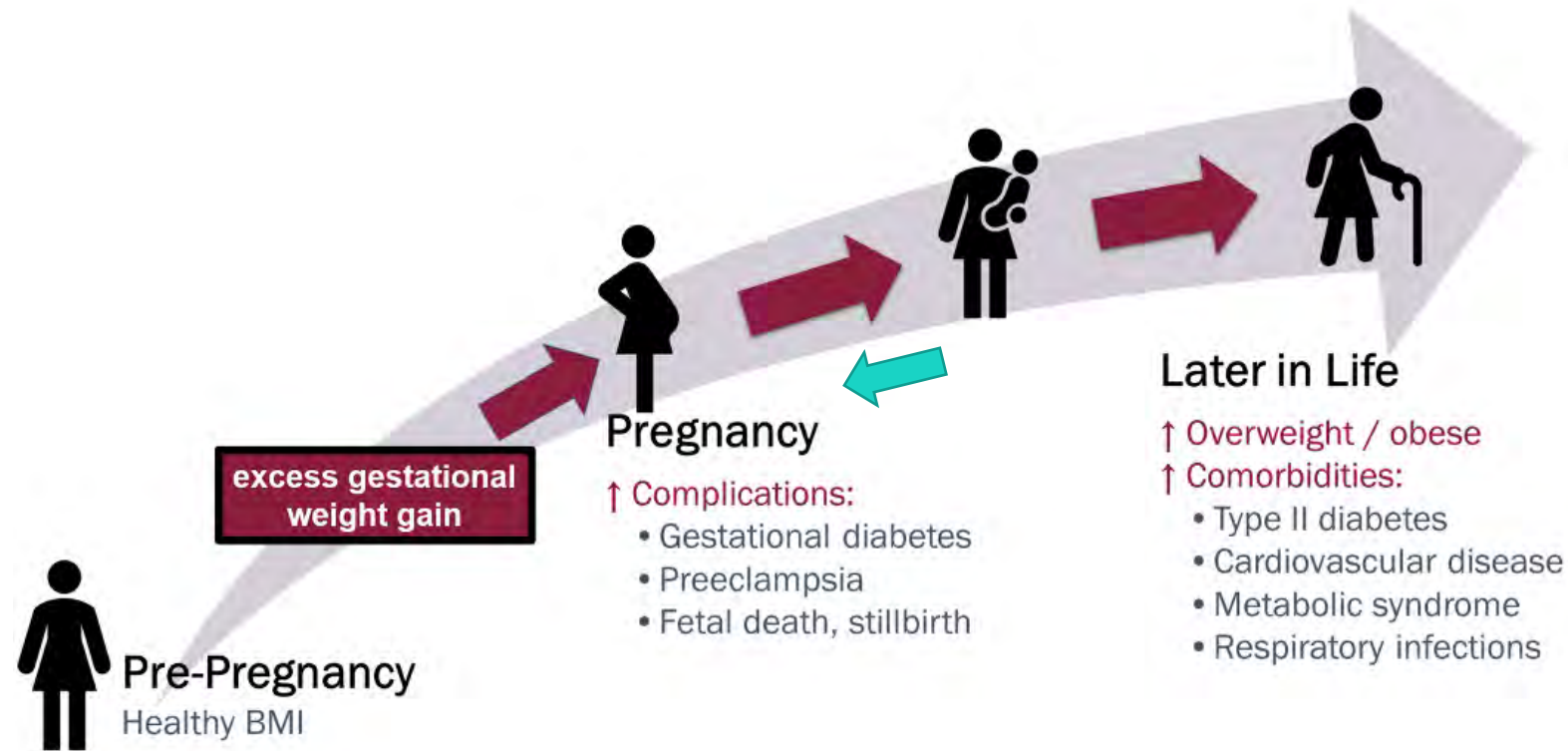
Deputy et al., 2015
IOM Report Implementing Guidelines on Weight Gain & Pregnancy

Contributing Factors to Maternal Obesity



Deputy et al., 2015
IOM Report Implementing Guidelines on Weight Gain & Pregnancy

Cycle of Obesity



Factors that Influence PPWR

Pre-pregnancy weight: high pre-pregnancy BMI

EGWG: weight gain in excess of IOM guidelines

Breastfeeding: suggested to positively influence PPWR, but might be offset by increased appetite

Racial/Ethnic Differences: a relatively small number of studies have suggested race, ethnicity, and cultural effects on PPWR

Psychosocial Factors: depression, anxiety, fatigue, or sleep

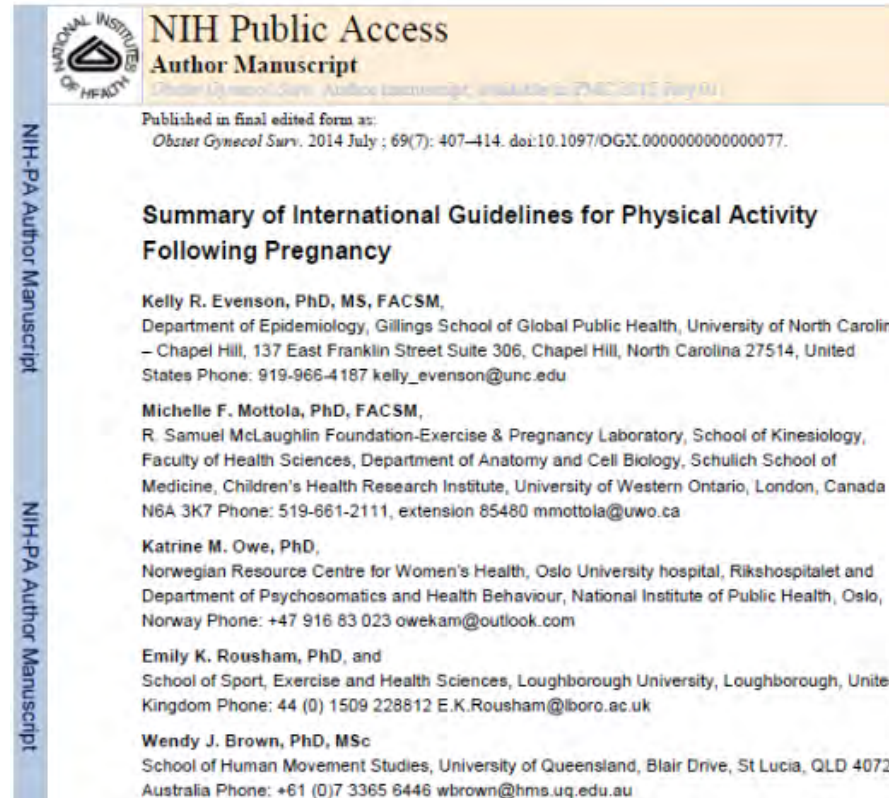
Sociodemographic Factors: young maternal age, unemployment, low education, parity, lower income

Lifestyle factors: low exercise frequency, high total energy intake, smoking

McKinley et al., 2018



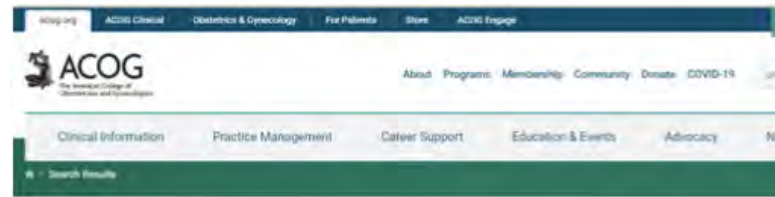
Before 2014...



- Aerobic (3/6)
- Pelvic floor exercise (3/6)
- Strengthening (2/6)
- Stretching (2/6)
- Walking (2/6)

Evenson et al., 2014

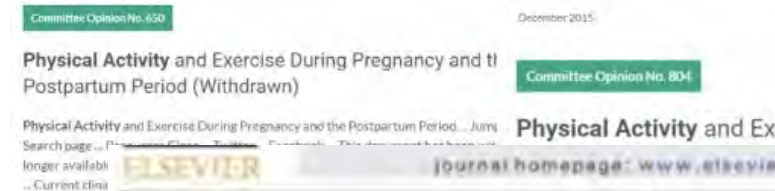
Since 2014...



Benefits of Physical Activity during Pregnancy and Postpartum: An Umbrella Review

LORETTA DIPIETRO¹, KELLY R. EVENSON², BONNY BLOODGOOD³, KYLE SPROW⁴, RICHARD P. TROIANO⁴, KATRINA L. PIERCY⁵, ALISON VAUX-BJERKE⁶, and KENNETH E. POWELL⁶, FOR THE 2018 PHYSICAL ACTIVITY GUIDELINES ADVISORY COMMITTEE*

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Review

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Australian guidelines for physical activity in pregnancy and postpartum

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Pregnancy care
Recommendations

BACKGROUND:
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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 related complications to: (1) meet the Australian Physical Activity and Sedentary Behaviour Guidelines for Adults before

onsensus statement

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Jaramillo Garcia,⁵
at,¹⁰ Phil Chilibeck,¹¹
I,¹ Linda G Slater,¹⁵

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1549-1559, https://
/doi.org/10.1016/j.



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Key Recommendations

- All healthy postpartum individuals should accumulate **150 minutes of moderate-intensity activity per week**. Starting with 10-minute bouts and gradually increasing to 20-30 minute bouts.
- Incorporating a variety of **aerobic and muscle-strengthening** activities. Adding gentle stretching may also be beneficial.
- 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 activities will be limited until **pelvic organs and MSK health** structures are recovered.
- Light physical Activity with pelvic floor exercises and stretching should be **resumed immediately**. Small amounts of physical activity, and gradually increase **frequency, intensity, and duration** over time.
- Discontinue exercise if they feel **pain**. If pelvic pain persists after 6 weeks pp, consult a physical therapist.

Key Recommendations

- Regular aerobic exercise in **lactating mothers** has been shown to improve maternal cardiovascular fitness.
- Mild- to moderate-intensity exercise during lactation **does not affect the quantity or composition of breast milk** or impact infant growth.
- Breastfeeding women may find wearing a **fitted bra** with features of greater breast elevation.
- Strong evidence suggests that **stabilization exercises** are not more effective than any other form of active exercise to treat low back pain and pelvic girdle pain.
- Women presenting with **low back and pelvic girdle pain at 6 weeks postpartum** should be referred to a sport/women's health physiotherapist.

Consult with a health care provider if there are any questions/concerns.



Benefits of PA & Exercise

- ✓ Promotes return to pre-pregnancy weight (Lim et al., 2015; Nascimento et al., 2014)
 - ✓ Weight loss or management
- ✓ Decreases chronic disease risk (Guo, 2016; Di Biase, 2019)
- ✓ Improves breastfeeding outcomes (Bane, 2015)
- ✓ Improves fitness (ACSM, 2020)
 - ✓ Cardiorespiratory, muscular strength & endurance (PFM), flexibility
- ✓ Reduces fatigue & improved mood (Liu et al., 2020; Ashrafina et al., 2018)
- ✓ Reduces symptoms of depression & anxiety (Pentland et al., 2022; Carter et al., 2019)
- ✓ Provides opportunity for social support & interaction
- ✓ Improved body image (Brown et al., 2022)

Barriers & Facilitators to PA

Barriers

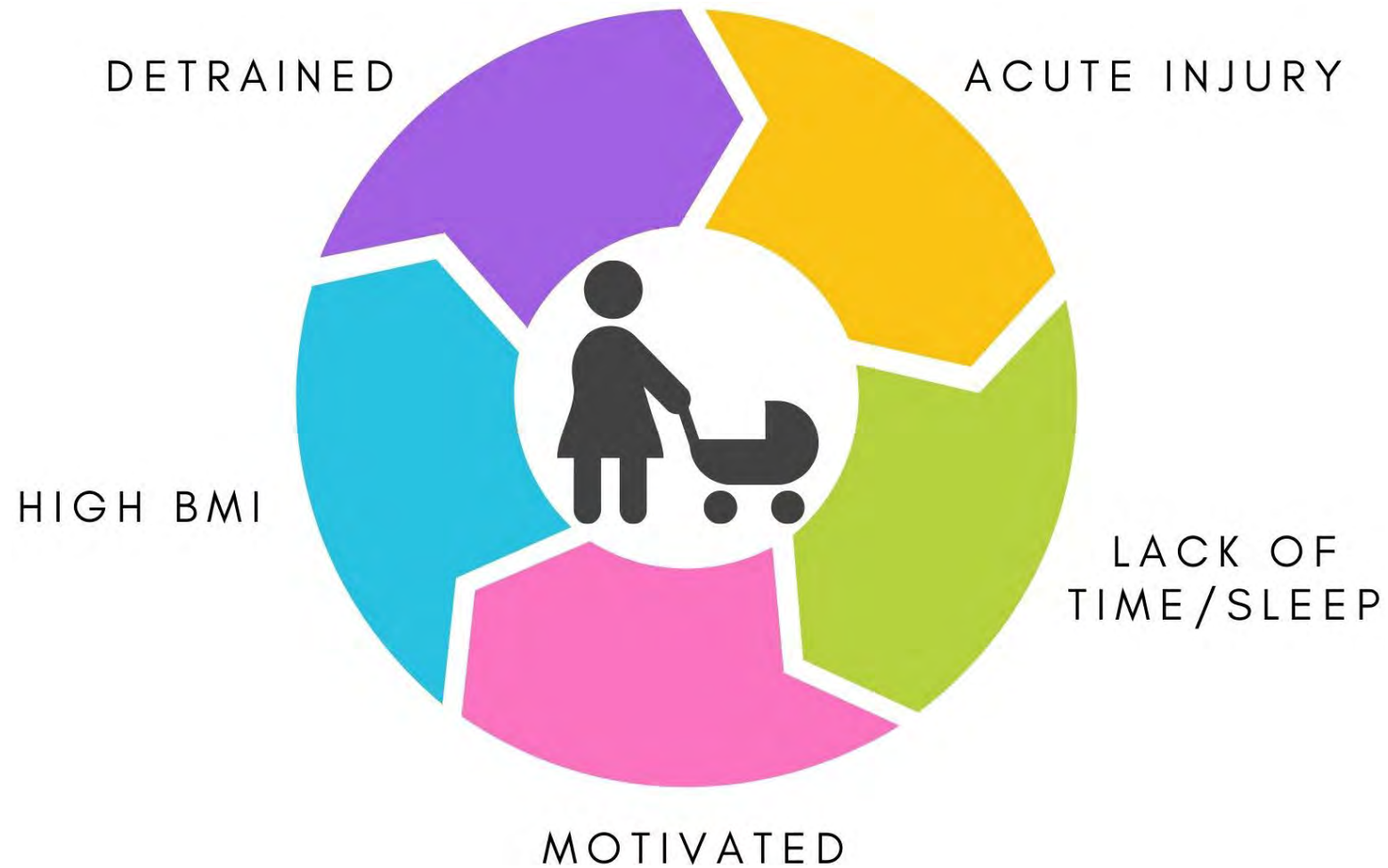
- Mode of delivery
- Discomforts / complications
- Lack of social support (family, society, health policies)
- No knowledge (benefits, safety...)
- Fatigue
- Lack of time
- Baby feeding and care
- Standard of living
- Weather
- Culture

Facilitators

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

Saligheh et al., 2016

(Most) Postpartum Clients...



Questions to ask...

- How many children do you have?
- What activities/exercise did you do throughout your pregnancy?
- What was your delivery like?
- Are you currently breastfeeding (exclusively)?
- What activities/exercise have you been participating in since you gave birth?
- What activities do you hope to start/resume now (short-term)?
- What activities do you hope to resume in 6-12 months (long-term)?
- Are you planning to become pregnant again within the next 2 years?

Exercise Screening

Few questionnaires have been validated for postpartum populations, specifically...

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 help you decide if 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 non-fainting jolting during vigorous exertion.	☐	☐
4) Have you ever been diagnosed with another chronic medical condition (other than heart disease or high blood pressure)? PLEASE LIST CONDITIONS HERE:	☐	☐
5) Are you currently taking prescribed medications for a chronic medical condition? PLEASE LIST CONDITIONS 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 CONDITIONS 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.

- ☒ I am becoming much more physically active – start slowly and build up gradually.
- ☒ Follow Global Physical Activity Guidelines for your age (<https://app.who.int/his/handbook/1065/14396>).
- ☒ You may take part in a health and fitness appraisal.
- ☒ If you are over the age of 45 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 any 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 flu; it is best to wait until you feel better.
- ☒ You are pregnant – talk to your health care professional, your physician, a qualified exercise professional, and/or complete the additional P1 at www.exerciseisbest.org 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.

The International Physical Activity Questionnaire (IPAQ-SF)
(Craig et al., 2003)

The Physical Activity Readiness Questionnaire for Everyone (Par-Q +) (Warburton et al., 2010)

The 12-item short-form health survey (SF-12) (Ware et al., 1996)

The Edinburgh Postnatal Depression Scale (EPDS) (Cox et al., 1987)

Pelvic health assessment with a specialist physiotherapist (Goom et al., 2019).

Diastasis Rectus Abdominis screening with a specialist physiotherapist (Goom et al., 2019).



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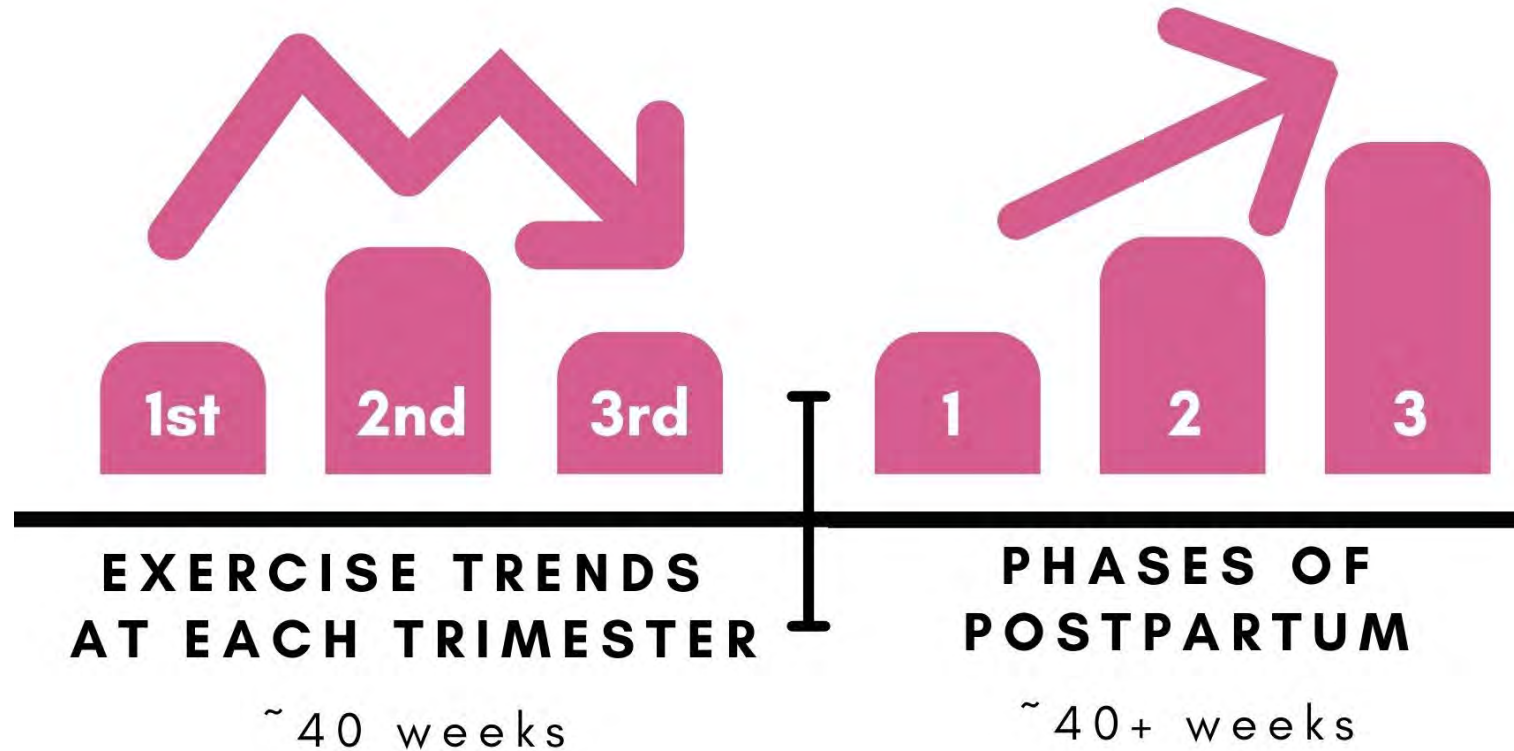
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What NSCA-CPTs know well...

- ☐ Reversibility
- ☐ Specificity
- ☐ Progression
- ☐ Overload
- ☐ Adaptation



Periodization



Exercise Intensity

- Borg scale (RPE)
- Heart rate
- Talk test

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.

Mottola et al., 2018

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.

Exercise Selection

- Pelvic floor muscle training*
- Cardiovascular training
- Resistance training
- Flexibility training
- Supervised vs. unsupervised
- Individual vs. group
- Indoor vs. outdoor

Find out their “WHY?”



Santos-Rocha, 2022

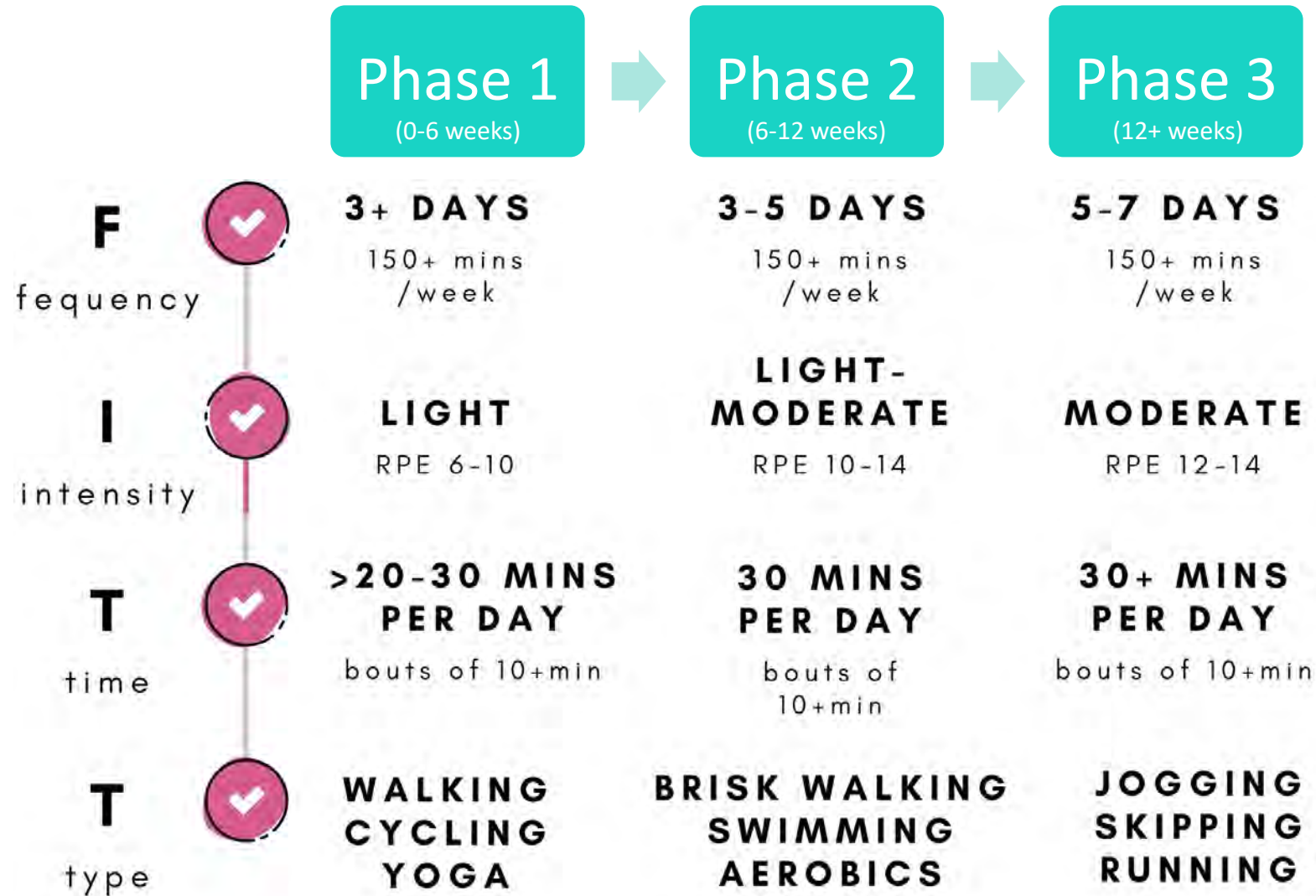
Exercise Progression

- Type of Exercise
 - 'can' do vs. 'should' do
- Body Position
 - supine, prone, side lying, 4-pt, angled, reclined, seated, standing
- Type of Movement
 - Static, dynamic, anti-rotation, rotation, flexion, extension
- Duration of Activity
 - sets, rest, circuits
- Intensity
 - tempo, reps, weight

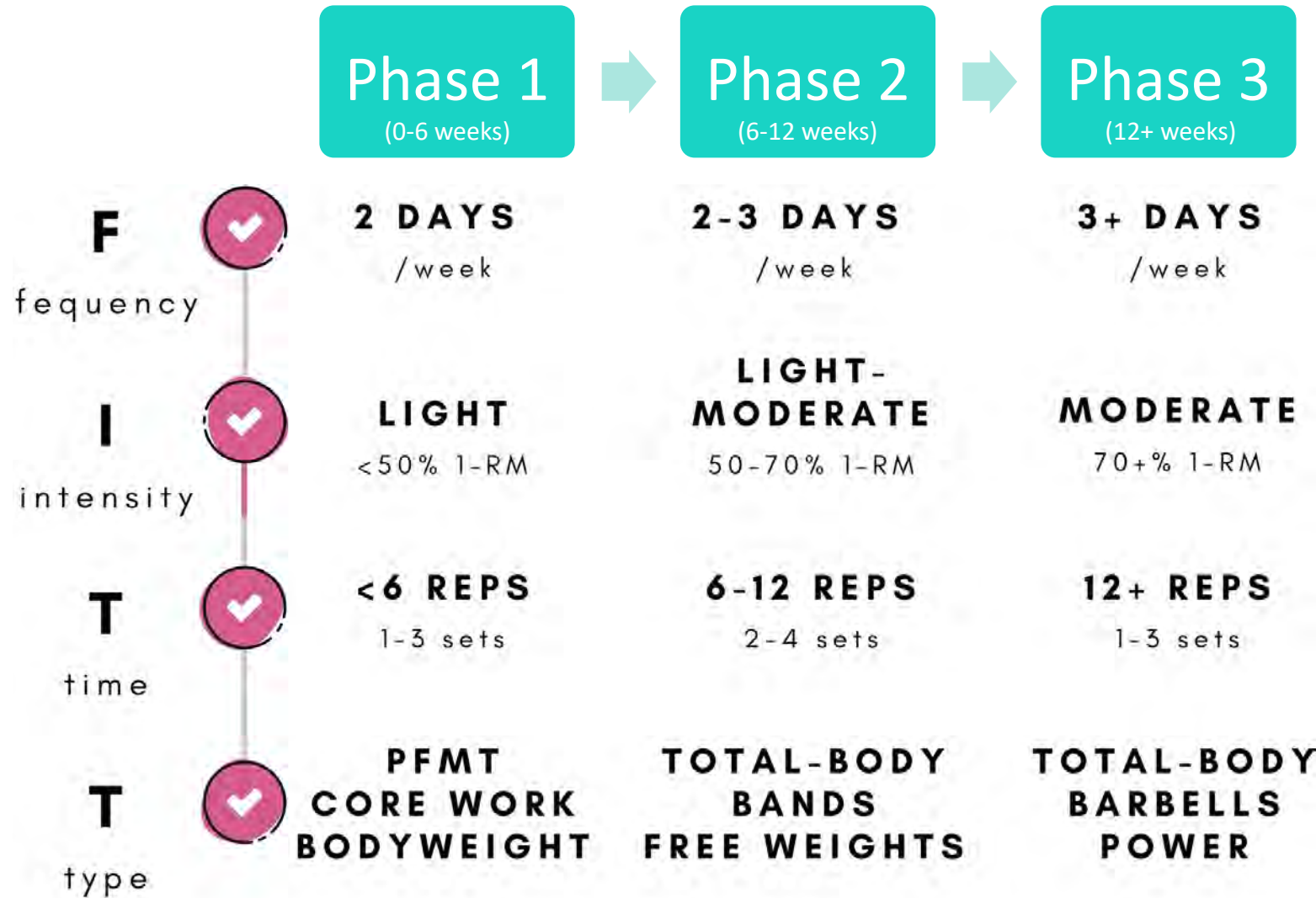


Santos-Rocha, 2022

Cardiovascular Training Progression



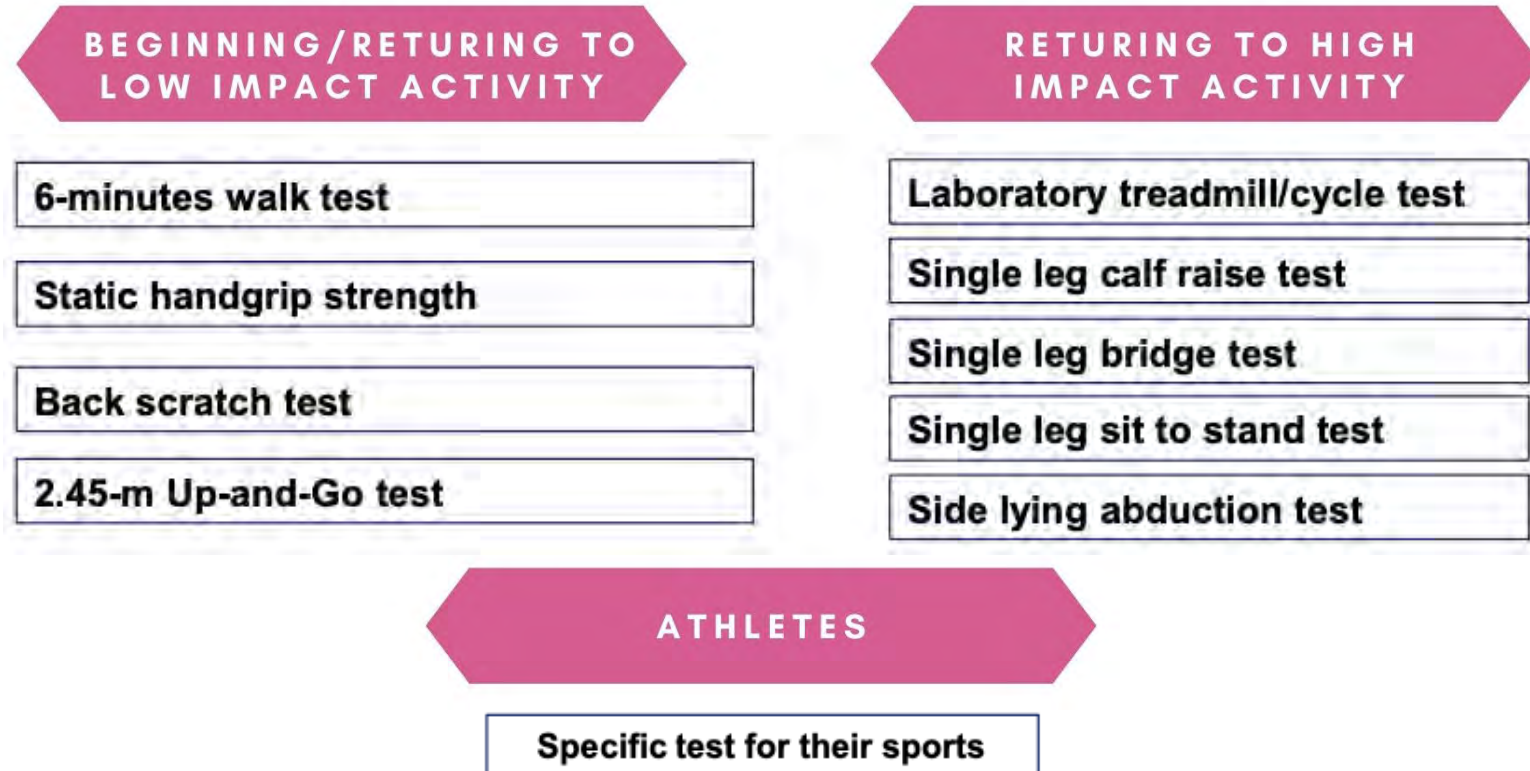
Resistance Training Progression



Exercise Progression (videos)

- Belly/Diaphragm/Yoga Breathing
 - Tempo 5-1-5-1
- Posture
 - Pec stretching, back activation
- TVA
 - Dead-bugs
 - Bird-dog
- Obliques
 - Side plank
- Glutes
 - Clam shells
 - Bridging

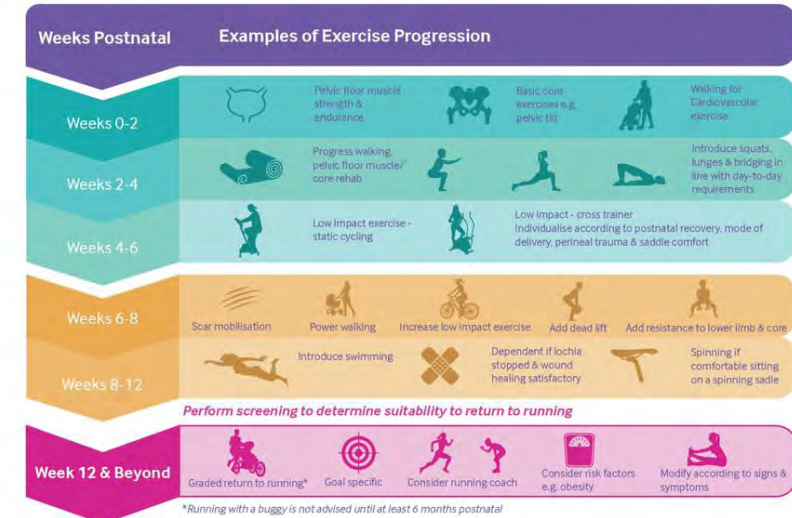
Pre-Exercise & Fitness Testing



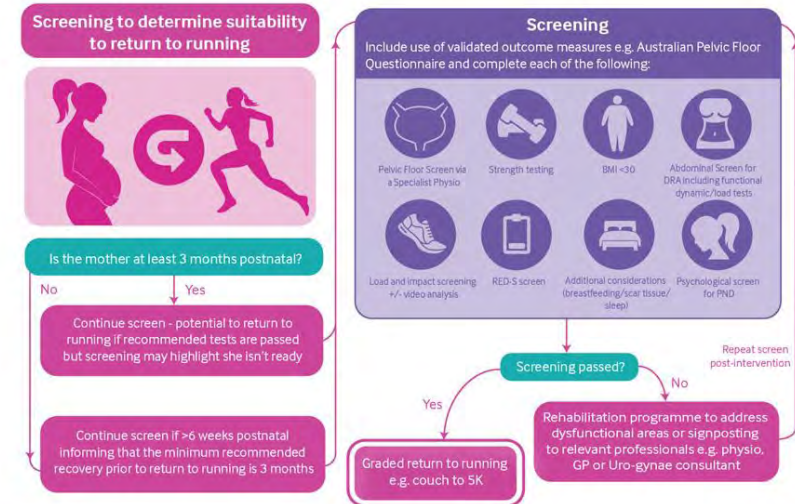
Groom et al., 2019

Infographic: guidance for medical, health and fitness professionals to support women in returning to running postnatally.

Guidance for Medical, Health & Fitness Professionals to Support Women in Returning to Running Postnatally



*Running with a buggy is not advised until at least 6 months postnatal



Source: Goom T, Donnelly G & Brockwell E. Returning to running postnatal - Guidelines for medical, health and fitness professionals managing this population. March 2019



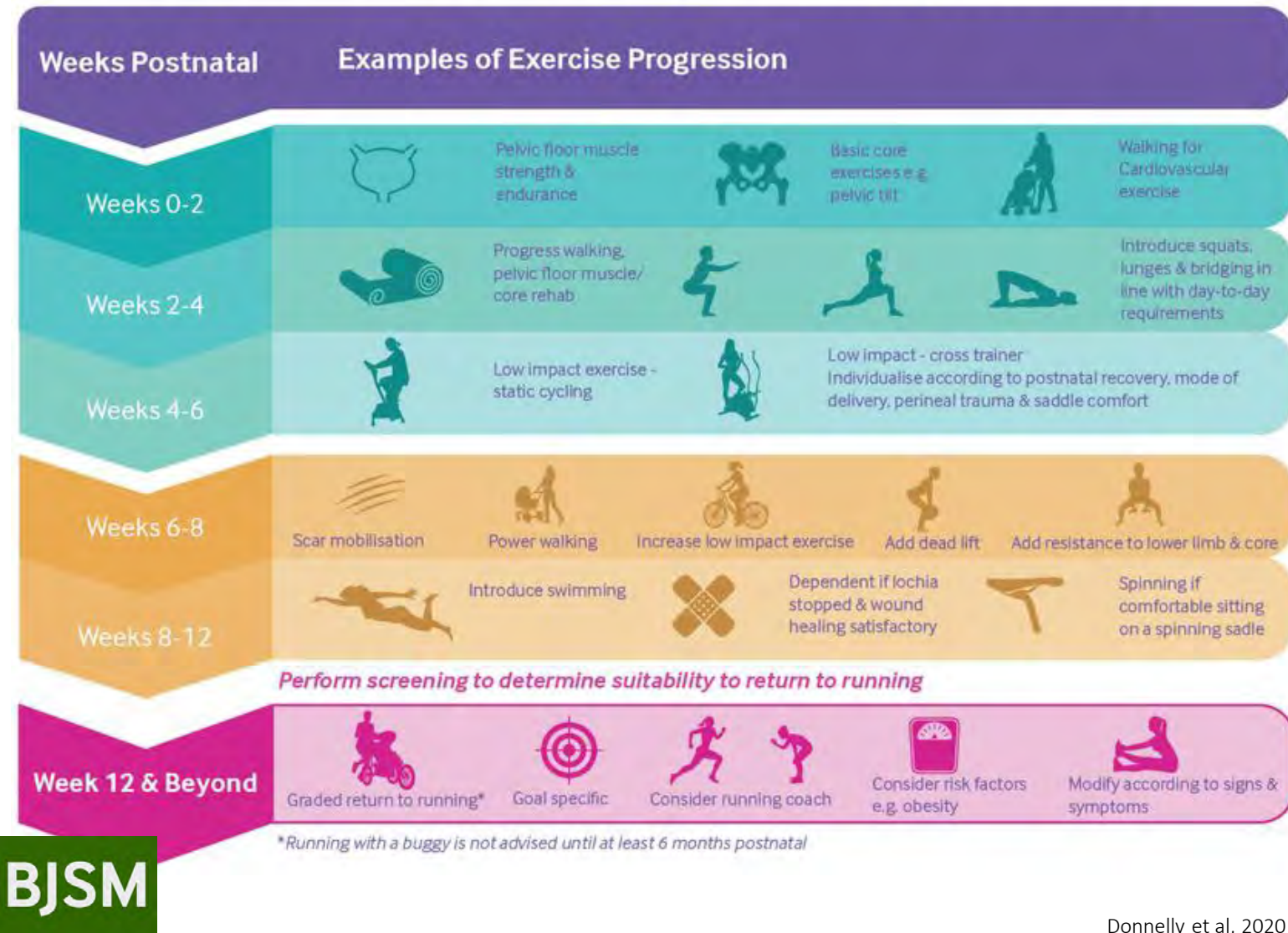
Donnelly et al, 2020



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Guidance for Medical, Health & Fitness Professionals to Support Women in Returning to Running Postnatally



Donnelly et al, 2020

Screening to determine suitability to return to running



Is the mother at least 3 months postnatal?

No

Yes

Continue screen - potential to return to running if recommended tests are passed but screening may highlight she isn't ready

Continue screen if >6 weeks postnatal informing that the minimum recommended recovery prior to return to running is 3 months

Screening

Include use of validated outcome measures e.g. Australian Pelvic Floor Questionnaire and complete each of the following:



Pelvic Floor Screen via a Specialist Physio



Strength testing



BMI < 30



Abdominal Screen for DRA including functional dynamic/load tests



Load and impact screening +/- video analysis



RED-S screen



Additional considerations (breastfeeding/scar tissue/sleep)



Psychological screen for PND

Screening passed?

Yes

No

Graded return to running e.g. couch to 5K

Rehabilitation programme to address dysfunctional areas or signposting to relevant professionals e.g. physio, GP or Uro-gynae consultant

Repeat screen post-intervention

Source: Goom T, Donnelly G & Brockwell E. Returning to running postnatal - Guidelines for medical, health and fitness professionals managing this population. March 2019

SMI Sports Medicine NI

BJSM

Donnelly et al, 2020

Elite Athletics

1. Return to participation
2. Return to sport
3. Return to performance

nt

Exercise and pregnancy in recreational and elite athletes: 2016/2017 evidence summary from the IOC expert group meeting, Lausanne. Part 5. Recommendations for health professionals and active women

Kari Bø,^{1,2} Raul Artal,³ Ruben Barakat,⁴ Wendy J Brown,⁵ Gregory A L Davies,⁶ Michael Dooley,⁷ Kelly R Evenson,⁸ Lene A H Haakstad,⁹ Bengt Kayser,¹⁰ Tarja I Kinnunen,¹¹ Karin Larsen,¹² Michelle F Mottola,¹³ Ingrid Nygaard,¹⁴ Mireille van Poppel,¹⁵ Britt Stuge,¹⁶ Karim M Khan¹⁷

BMJ Open
Sport &
Exercise
Medicine

Elite athletes get pregnant, have healthy babies and return to sport early postpartum

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It takes a village...

...create yours

- ☐ OB/GYN/Sports Med MDs
- ☐ Midwives, doulas
- ☐ RDs, RNs
- ☐ Women's health PTs, OTs
- ☐ DCs (Webster-certified)
- ☐ RMTs
- ☐ Lactation consultants
- ☐ Infant sleep consultants
- ☐ Psychologist/psychiatrists
- ☐ Exercise physiologist/specialist/coach

Thank You



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Stephanie Paplinskie, MA, CSCS
*Training the Postpartum Client – Exercise Considerations
When Working with Individuals Who Have Given Birth*

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References

