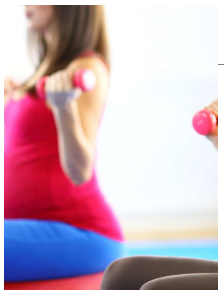
Physiotherapy in Pregnancy

CLAIRE DE VOS

Overview

- Exercise Guidelines in Pregnancy
- Pelvic Girdle Pain
- PS pain
- LBP
- Pelvic Floor Dysfunction
- Other Msk Conditions



Exercise Guidelines in Pregnancy

2019 Canadian Guidelines for Exercise in Pregnancy (Mottola et al., 2018)

Sports Medicine Australia (SMA)- Position Statement: Exercise in Pregnancy and the Post Partum Period (SMA, 2016)

- Contraindications & Relative Contraindications
- Benefits of Exercise during Pregnancy
- Exercise Guidelines in Pregnancy
- Considerations in Exercise Prescription

Absolute Contraindications

- Ruptured membranes.
- Premature labour.
- Unexplained persistent vaginal bleeding.
- Placenta praevia after 28/40
- Pre-eclampsia.
- Incompetent cervix.
- Intrauterine growth restriction.
- High-order multiple pregnancy (eg, triplets).
- Uncontrolled type I diabetes.
- Uncontrolled hypertension.
- Uncontrolled thyroid disease.
- Other serious cardiovascular, respiratory or systemic disease

(Mottola et al., 2018)

Relative Contraindications

- Recurrent pregnancy loss.
- Gestational hypertension.
- Hx of spontaneous preterm birth.
- Mild/moderate cardiovascular or respiratory disease.
- Symptomatic anaemia.
- Malnutrition.
- Eating disorder.
- Twin pregnancy after the 28th week.
- Other significant medical conditions.

(Mottola et al., 2018)

Benefits of Exercise in Pregnancy

Benefits to Mother	Benefits to Foetus

• Improved muscle strength & endurance
• Improve CV and respiratory function
• ↓ risk of pre-eclampsia
• ↓gestational hypertension
• ↓ gestational diabetes &improved blood glucose levels
• ↓ caesarean section &↓instrumental delivery
• ↓urinary incontinence
• ↓excessive & total gestational weight gain
• ↓ fatigue, depression & anxiety
• ↓ severity of lumbopelvic pain
• ↓ constipation
	• ↓ risk of larger/smaller for gestational age foetus
	• 39% decr risk of >4000g birth weight with "exercise only interventions" (Davenport et al., 2018)
	• No associations b/w exercise & pre-term birth or low birth
	• .Long term health benefits:
	  • Decr risk childhood obesity
	  • ↓ risk of CV or metabolic conditions

(Mottola et al., 2018, Davenport et al., 2018)

Canadian Exercise Guidelines in Pregnancy 2019

1. All women without contraindication should be physically active throughout pregnancy
   Strong Recommendation, moderate quality evidence

2. Pregnant women should accumulate at least 150min of mod intensity physical activity each week
   Strong recommendation, moderate-quality evidence.

3. Physical activity should be accumulated over a min of 3 days per week; however, being active every day is encouraged.
   Strong recommendation, moderate-quality evidence.

4. Pregnant women should incorporate a variety of aerobic exercise & resistance training. Adding yoga and/or gentle stretching may also be beneficial.
   Strong recommendation, high-quality evidence.

5. PFMT may be performed on a daily basis to reduce the odds of UI. Instruction on the proper technique is recommended to obtain optimal benefits.
   Weak recommendation, low-quality evidence.

(Mottola et al., 2018)

Exercise Guidelines in Pregnancy (SMA)

Frequency	• Daily • At least 3x per week
Intensity	• "Moderate" • 12-14 on Borg Scale • Could talk but not sing
Time	• Accumulate 150-300mins per week. • At least 30mins each session, but 60mins is better
Type	• Brisk walk, swimming, aerobics, stationary bike • Muscle strengthening exercises (TB, weights, body weight) 2x per week

(SMA, 2016)

Exercise to Avoid

- Exercising in excessive heat, especially humidity
- Contact or collision (eg: soccer, ice hockey, martial arts etc)
- Risk of falling (eg: judo, skiing, horse riding, skating etc)
- Significant changes in pressure (eg: scuba diving, sky diving etc)
- Abdominal trauma/pressure (eg: heavy weight lifting etc)
- Extreme balance/co-ordination/agility (eg: gymnastics, water skiing etc)
- High intensity at altitudes >2000m (if you usually live in lower altitude)
- Heavy weights (?)
- Exercise in supine position: When? Why?

(Mottola et al., 2018, SMA, 2016)

Signs to Cease Exercise

- Persistent excessive shortness of breath
- Severe chest pain
- Regular and painful uterine contractions.
- Vaginal bleeding.
- Persistent loss of fluid from the vagina indicating rupture of the membranes.
- Persistent dizziness or faintness that does not resolve on rest.

(Mottola et al., 2018)

Exercise Considerations

Joints | Cardiovascular | Abdominal separation

Pelvic Floor | Overheating | Other

You COULD...but SHOULD you??

Considerations- Joints

Consider

- Incr laxity in ligaments- peaks in third trimester
- Impact on knees, ankles etc
- Many women will experience PGP (up to 50%) (Vleeming, Albert, Östgaard, Sturesson, & Stuge, 2008)

Therefore:

- Consider appropriateness of SL activities (step ups, lunges, running, power walking)
- Higher impact/change of direction
- Care with stretching

Cardiovascular Load

Consider:

- Decr blood flow to foetus w high intensity/vigorous exercise
- ↓ uterine blood flow during Valsalva
- Supine hypertension
- Consider physiological changes during pregnancy
- Decr peripheral resistance, LL venous pooling

Exercise modifications:

- Moderate intensity exercise (BORG, talk test)
- Higher reps/lower loads
- *No supine exercise after 16/40 gestation*
- Monitor women for symptoms e.g. dizziness, nausea, SOBOE
- Vary positions and avoid prolonged standing
- Incorporate muscle pump

Table 3

Activities to avoid during pregnancy

	Guidelines									
	Australia	Canada	Denmark	France	Japan	Norway	Spain	United Kingdom	United States (ACOG)	United States (USDHHS)
General Activities to Avoid:										
Abdominal trauma or pressure	Blunt trauma	Fetal trauma	X	X	X		X			
Altitude		X				X		X	X	
Contact or collision sports	X	X	X	X	X	4–6 months	X	X	X	X
Excessive body heat	X					X				
Excessive joint stress		X		X			X			
Falls or fall-related sports	X	X		X	X	X	X		X	X
Hot or humid weather	hot conditions	especially in first trimester			X	X	X	X		
High impact		X		X	X		X			
High loads during strengthening						X				
Hyperthermia							X	X		
Sedentary								X		
Standing, motionless						X			X	
Supine position (lying on back)	not after the first trimester	not after 16 weeks; modify position	use a tested position during strength training		not after 14 weeks	not after 14 weeks		not after 16 weeks	not after the first trimester	not after the first trimester
Uneven load during stretching		stretch with controlled movements				X	avoid extreme positions			
Vigorous intensity activities		on training for athletic competition	if not done before pregnancy		implied based on Borg scale	implied based on Borg scale	on more than 15 minutes per session			if not already highly active or doing vigorous intensity activity

SMA Guidelines

Activities which are characterised by the following are **considered unsafe** for pregnant women and should be avoided:

- Abdominal trauma or pressure (e.g. weight lifting).
- Contact or collision (e.g. soccer, ice hockey, martial arts etc).
- Hard projectile objects or striking implements (e.g. hockey, cricket, softball etc).
- Falling (e.g. judo, skiing, skating, horse riding etc).
- Extreme balance, coordination and agility (e.g. gymnastics, water skiing etc).
- Significant changes in pressure (e.g. scuba diving, sky diving etc).
- Heavy (greater than submaximal) lifting.
- High intensity training at altitudes greater than 2000m.
- Exercise in the supine position, or even motionless supine posture (e.g. in some yoga positions) may cause hypotension in some women; for safety, avoid supine exercise positions after 28 weeks' gestation; some exercises can be adapted to lying on the side.

Specific activities listed above are examples only; participation in specific activities should be discussed with the health care provider and should be reviewed as pregnancy progresses.

"Is supine exercise associated with adverse maternal and fetal outcomes? A systematic review" (Mottola et al., 2019)

What is already known

- There is evidence that during pregnancy the uterus may compress the vena cava in the supine position at rest, which may result in symptomatic hypotension in up to 10% of women (secondary to reduced preload, cardiac output and therefore blood pressure) and also compromise uterine blood flow through compression of the aorta.

What are the new findings

- Exercise interventions that included supine exercise were not associated with adverse pregnancy outcomes.
- However, supine exercise was not sufficiently quantified and compliance to that specific type of exercise was not reported.
- Evidence from observational studies suggested that 31% of women who participated in an acute bout of supine exercise showed potential adverse fetal responses (bradycardia and fetal heart rate patterns as defined by the study authors).
- There is insufficient evidence to determine whether exercise in the supine position is safe or should be avoided during pregnancy.

So…should we allow pregnant women to exercise in supine after 16 weeks?

Expert opinion:

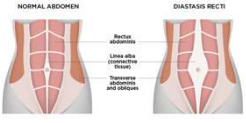
- Women can be symptomatic when exercising supine as early as 15 weeks
- Modify from 16 weeks

Give there are so many modifications- is it worth the risk?

Abdominal Separation

Consider:

- DRAM is a normal anatomical adaptation of pregnancy
- 100% of women have DRAM after 36/40
- Individual assessment is necessary
- Causes insufficiency of abdominal mm. particularly RA



Exercise Modifications:

- Avoid/modify exercises that cause "coning" or "doming"
- Common culprits: sit ups, planks, Russian twists, chin ups, pikes, 100s, other high load exs
- This does not mean no abdominal exercises
- Suggested alternatives?

Pelvic Floor

Consider:

- Pregnancy is a strong risk factor for PFMD
- Hormonal changes in pregnancy increase laxity and compromise integrity of support structures
- Load of foetus on pelvic floor muscles
- Continence status @ 30/40 is predictive of PN continence status

Exercise Modifications:

- Avoid or modify: high impact activities, high load abdominal exercises, heavy weight training
- ? Wide appropriateness of wide stance exs
- Ensure good MC during exercises
- Consider referral to C+WH physio (me)

Overheating

Consider:

- ↑ core temp of 1.5deg is harmful to foetus
- main risk is in first trimester

Exercise modifications:

- Adequate ventilation
- Regular rests and monitoring
- Loose fitting clothing
- Keep hydrated
- Hydro pools @ 33deg considered safe for mod intensity exercise

Other Considerations

- Change in COG
- Physiological: emotions, concentration, mood
- Proprioception
- Reflux/morning sickness
- Fatigue

Pregnancy Related Pelvic Girdle Pain (PRPGP)

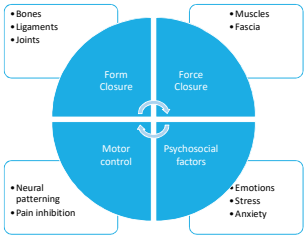
PGP is defined as pain between the posterior iliac crest and the gluteal fold, particularly in the vicinity of the sacroiliac joint (SIJ), which may radiate to the thighs and hips. (Walters, West, & A Nippita, 2018)

- Varied reported incidence: 4-74% (Vleeming, Albert, Östgaard, Sturesson, & Stuge, 2008)
- 50% cummulative incidence (Berg, Hammar, Möller-Nielsen, Lindén, & Thorblad, 1988)
- But probably closer to 20% (strong evidence) (Vleeming, Albert, Östgaard, Sturesson, & Stuge, 2008)

Risk Factors:

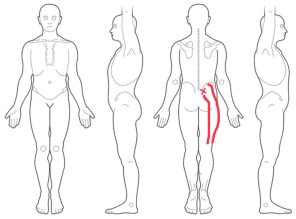
- Parity
- Previous pelvic trauma
- Hx of LBP
- High work load (occupational or recreational)
- Smoking
- ↑BMI

PRPGP- contributing factors

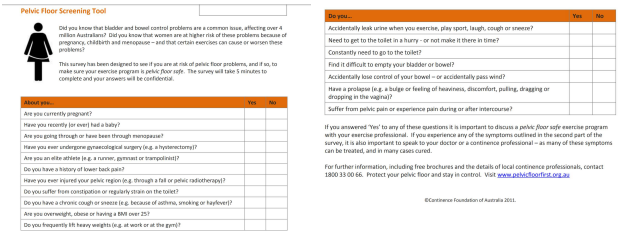


Subjective Assessment- PRPGP

- HOPC: incl MOI, duration of Sx
- Aggs/Eases
- 24hr pattern
- Night pain
- Irritability VAS (pain/bother)
- Psychosocial factors
- Beliefs/emotions
- Expectations
- Co-morbidities
- Area of Symptoms
- Consider further outcome measures….



Screen for PFMD



Pelvic Floor Screening Tool

Did you know that bladder and bowel control problems are a common issue, affecting over 4 million Australians? Did you know that women are at higher risk of these problems because of pregnancy, childbirth and menopause – and that certain exercises can cause or worsen these problems?

This survey has been designed to see if you are at risk of pelvic floor problems, and if so, to make sure your exercise program is *pelvic floor safe*. The survey will take 5 minutes to complete and your answers will be confidential.

About you…	Yes	No
Are you currently pregnant?		
Have you recently (or ever) had a baby?		
Are you going through or have been through menopause?		
Have you ever undergone gynaecological surgery (e.g. a hysterectomy)?		
Are you an elite athlete (e.g. a runner, gymnast or trampolinist)?		
Do you have a history of lower back pain?		
Have you ever injured your pelvic region (e.g. through a fall or pelvic radiotherapy)?		
Do you suffer from constipation or regularly strain on the toilet?		
Do you have a chronic cough or sneeze (e.g. because of asthma, smoking or hayfever)?		
Are you overweight, obese or having a BMI over 25?		
Do you frequently lift heavy weights (e.g. at work or at the gym)?		

Do you…	Yes	No
Accidentally leak urine when you exercise, play sport, laugh, cough or sneeze?		
Need to get to the toilet in a hurry - or not make it there in time?		
Constantly need to go to the toilet?		
Find it difficult to empty your bladder or bowel?		
Accidentally lose control of your bowel – or accidentally pass wind?		
Have a prolapse (e.g. a bulge or feeling of heaviness, discomfort, pulling, dragging or dropping in the vagina)?		
Suffer from pelvic pain or experience pain during or after intercourse?		

If you answered 'Yes' to any of these questions it is important to discuss a *pelvic floor safe* exercise program with your exercise professional. If you experience any of the symptoms outlined in the second part of the survey, it is also important to speak to your doctor or a continence professional – as many of these symptoms can be treated, and in many cases cured.

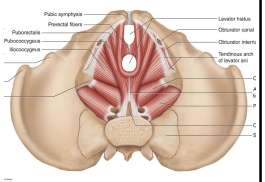
For further information, including free brochures and the details of local continence professionals, contact 1800 33 00 66. Protect your pelvic floor and stay in control. Visit www.pelvicfloorfirst.org.au

Why?

"Women with PGP had statistically significantly smaller levator hiatus areas and a tendency for higher vaginal resting pressure compared to the control group. A significantly smaller levator hiatus and a tendency for higher vaginal resting pressure may indicate increased activity of the PFM." (Stuge, Sætre, & Brækken, 2012)

"Findings corroborate and extend recent research supporting the hypothesis that a high proportion of pelvic floor muscle dysfunction is present among women with lumbopelvic pain." (Dufour, Vandyken, Forget, & Vandyken, 2017).

"Clinicians should be aware of the relation between PLBP and PFD and hence address both problems at the same time." (Pool-Goudzwaard et al., 2005)



Objective Assessment- PRPGP

Observation: posture, gait etc.

Aggravating activities/Functional Assessment
- STS
- Rolling
- Squats
- Other transfers

Cluster of pain provocation tests 3/5 = SIJ component
- Compression
- Distraction
- ★ Posterior pelvic pain provocation (P4)
- ★ Gaenslen's test
- Sacral Thrust

LxAROM
Hip AROM
- FADIR
- ★ FABER

Loading tests:
- ★ ASLR
- ★ Stork test/modified trendelenberg

Palpation:
- ★ LDL
- LxSp
- ★ Pain provocation/palp PS

These tests should guide your treatment

(Laslett, 2008, Vleeming et al., 2008)

PRPGP

- Joint mobilisation
- Support belt
- ICE

Other…
- ADL modification
- low-heeled shoes
- reducing non-essential weight-bearing activities (eg climbing stairs, standing/walking for long periods of time)
- avoiding standing on one leg (eg by sitting down to get dressed)
- ↓ hip abduction (eg taking care getting in/out of cars, baths or squatting)
- Toddler care
- Analgesia

- STW
- Stretches
- Spikey ball
- Group physio
- Home Exercise Program
- Tubi-grip/support shorts

- Motor control exercise
- Functional modulation
- STW/jt mobilisation
- Pain Mx

- Education
- Reassurance
- Mindfulness
- Relaxation
- Gentle exercise
- Social support
- Referral

"The strongest predictor of pelvic girdle pain not becoming chronic is the belief it will not"

Pubic Symphysis Pain

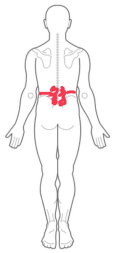
- Same principals for Sub/Ob Ax
- Plus:
  - Adductor squeeze
  - Palp Adductors
- Consider OA of gluts/pelvic floor
  - Down-training and referral onwards where necessary
  - Careful screening for central drivers during subjective
- Belts helpful ++
- Edu: mini skirt, in/out car, bowl of water, stand up tall, weight through heels.

Pregnancy Related LBP

- Often occurs with PRPGP
- Therefore assessment is the same
- Study of patients with LBP/PGP in pregnancy:
  - 50% of symptomatic women PGP
  - 33% LBP
  - 17% both
- Usually starts around 18/40, peaks 24-36/40

Differentiation:

- site of pain
- character and severity
- provoking factors
- resultant dis-ability
- pain provocation tests



(Vermani, Mittal, & Weeks, 2010; Vleeming, Albert, Östgaard, Sturesson, & Stuge, 2008)

Differential Dx- PGP/LBP

- Urinary tract infection
- Osteomyelitis
- Lumbar disk lesion/prolapse
- Arthritis of spine/hip
- Lumbar stenosis
- Cauda equina syndrome
- Spondylolisthesis
- Pregnancy-associated osteoporosis
- Femoral vein thrombosis
- Osteitis pubis
- Rupture of symphysis pubis
- Sciatica
- Obstetric complications (preterm labor, abruption, red degeneration of
- uterine fibroid, round ligament pain, and chorioamnionitis)

(Vermani, Mittal, & Weeks, 2010)

Other Msk Conditions

Rib/Thoracic Pain
Common during third trimester
Fundus is highest @ 36/40
Bucket handle analogy
Tight and TOP costovertebral mm. & txsp paraspinals
TOP and stiff TxSp paraspinals and costovertebral jts

Knee pain
PFJ dysfunction
Incr laxity
Incr load
Incr fluid
Consider: biomechanics, LL strength, correct gait

Hand/Wrist
Incr fluid during pregnancy in extremities
May be worse due to occupation/care of toddler
Clear jts above and below
Rx: splinting, edu, posture ADLS

Feet
Incr laxity in ligamentous support
Incr swelling extremities
Incr load/weight gain
Plantar fascia pain
Consider footwear, elevation, taping & referral

The Pelvic Floor and Pregnancy

- Increased load on pelvic joints, ligaments and muscles
- Pregnancy & delivery most significant risk factors for UI and POP (Glazener et al., 2013; Sangsawang & Serisathien, 2012)
- Level 1, Grade A evidence to support supervised, intensive PFMT for prevention of UI in pregnancy (Haylen et al., 2016)
- Level 1, Grade A evidence to support supervised, intensive PFMT for the treatment of UI, particularly SUI (Haylen et al., 2016)
- Previously discussed implications for exercise…

Pelvic Floor- Weight Gain in Pregnancy

Area	Weight gain in grams
Breasts	500-800g
Uterus	1,000g
Placenta	600g
Amniotic fluid	800g
Baby	3,300g
Blood Volume	1,200g
Fat	4,000g
Extracellular Fluid	3,000g
Total	14,400g

PFMT in Pregnancy

Frequency	• Daily • 3x per day
Type	• Strength 8-12 reps, close to maximal contraction 8-12secs ★ • Fast Holds • Endurance
Duration	• At least 8 weeks

Objective Assessment- PRPGP

Aggravating activities/Functional Assessment
- STS
- Rolling
- Squats
- Other transfers

Cluster of pain provocation tests 3/5 = SIJ component
- Compression
- Distraction
- Posterior pelvic pain provocation (P4)
- Gaenslen's test
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Loading tests:
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- Stork test/modified trendelenberg

Palpation:
- LDL
- LxSp
- Pain provocation/palp PS

These tests should guide your treatment

Objective Assessment- PRPGP

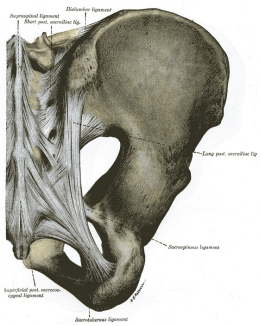
Video of SIJ cluster tests

https://www.youtube.com/watch?v=g8txpsqHYpQ

Posterior Pelvic Pain Provocation (P4)

LDL Palpation

- Helps to rule out SIJ component
- https://www.youtube.com/watch?time_continue=38&v=bwfJxDQrXw8
- Palp of LDL
- If pain continues for 5secs after pressure eases test is +ive
- May record as "tender"

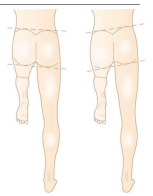


Stork Test/Modified Trendelenburg Test

- Considered in the research to be SIJ pain provocation test

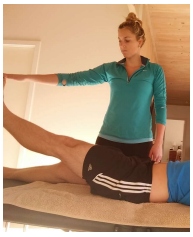
BUT

- Useful assessment tool of load bearing capacity
- Test + re-test with cueing of..
  - Multifidus
  - TrA
  - Gluts
  - PF
- Can then guide Rx
- Remember: movement of the SIJ cannot be validly or reliably assessed



Active Straight Leg Raise Test

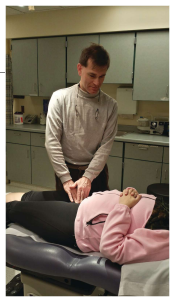
- Not difficult at all = 0
- Minimally difficult = 1
- Somewhat difficult = 2
- Fairly difficult = 3
- Very difficult = 4
- Unable to do = 5



Modifications:
- Cue: PF, TrA, multifidus, gluts, lats, obliques
- Compression

Pubic Symphysis (PS) Test

- Palp of LDL
- If pain continues for 5secs after pressure eases test is +ive
- May record as "tender"



Gaenslen's Test

- Positioned supine with the painful leg resting on the edge of the treatment table.
- Flex the non symptomatic hip, while the knee also flexed (up to 90 degrees).
- The patient should hold the non-tested (asymptomatic) leg with both arms while the therapist stabilizes the pelvis and applies passive pressure to the leg being tested (symptomatic) to hold it in a hyperextended position.
- A downward force is applied to the lower leg (symptomatic side) putting it into hyperextension at the hip, while a flexion based counterforce is applied to the flexed leg pushing it in the cephalad direction causing torque to the pelvis

IT'S FRI-YAY