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Sharing physical activity knowledge

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Physical activity throughout pregnancy:

A prescription for improved maternal/fetal health

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Introduction

The health benefits of physical activity have been described for millennia. Extensive research has demonstrated the benefits of physical activity on wellbeing, chronic disease risk, and longevity in most populations. Despite this, pregnant women have historically been told to rest and relax. For many years, women were encouraged to live a sedentary lifestyle during their pregnancies out of fear of harm to the developing baby, despite there being no evidence to substantiate such claims. In 1985, the first guidelines for prenatal exercise were developed and provided guidance for women who were interested in being physically active during their pregnancy. At the time, this field of research was just beginning to emerge, and as such, the original recommendations were primarily based on expert opinion and very little supporting evidence.

In the subsequent 30 years, research in this area has exploded. We now know that pregnancy is a unique period in a woman's life where positive lifestyle behaviours, such as physical activity, can significantly affect her own health and the health of her baby. Currently, there are more than a dozen prenatal physical activity guidelines around the world, yet, fewer than 15% of pregnant women actually meet these recommendations and reap the associated health benefits.¹ This is of particular importance as pregnancy complications, including gestational diabetes mellitus, preeclampsia, excessive gestational weight gain, and newborn macrosomia, have risen dramatically over the past few decades and their development can be linked to modifiable risk factors.^{2,3} As such, clinicians and researchers alike have begun to investigate the risks of physical inactivity during pregnancy on both maternal and infant health. The aim of our work was therefore to develop a clear, evidence-based physical activity guideline for use throughout pregnancy that contributes to improving short- and long-term health of both mother and baby.

S U M M A R Y

Being physically active throughout pregnancy can be beneficial for both mother and baby. But how much and at what intensity is recommended?

This WellSpring highlights the new 2019 Canadian Guideline for Physical Activity throughout Pregnancy which provides a specific prescription to engage in physical activity that is both safe and beneficial for mothers and babies.

Table 1: Specific recommendations in the 2019 Canadian Guideline for Physical Activity throughout Pregnancy⁶⁻⁸

Recommendation	Quality of evidence
1. All women without contraindication (see Table 2) should be physically active throughout pregnancy. Specific subgroups were examined:	Strong recommendation, moderate quality evidence.
• Women who were previously inactive.	Strong recommendation, moderate quality evidence.
• Women diagnosed with gestational diabetes mellitus.	Weak recommendation ^a , low quality evidence.
• Women categorized as overweight or obese (pre-pregnancy body mass index ≥ 25 kg/m ²).	Strong recommendation ^b , low quality evidence.
2. Pregnant women should accumulate at least 150 minutes of moderate-intensity ^c physical activity each week to achieve clinically meaningful health benefits and reductions in pregnancy complications.	Strong recommendation, moderate quality evidence.
3. Physical activity should be accumulated over a minimum of three days per week; however, being active every day is encouraged.	Strong recommendation, moderate quality evidence.
4. Pregnant women should incorporate a variety of aerobic and resistance training activities to achieve greater benefits. Adding yoga and/or gentle stretching may also be beneficial.	Strong recommendation, high quality evidence.
5. Pelvic floor muscle training (e.g., Kegel exercises) may be performed on a daily basis to reduce the risk of urinary incontinence. Instruction in proper technique is recommended to obtain optimal benefits.	Weak recommendation ^d , low quality evidence.
6. Pregnant women who experience light-headedness, nausea, or feel unwell when they exercise flat on their back should modify their exercise position to avoid the supine position.	Weak recommendation ^e , very low quality evidence.

Table Notes:

^a This was a weak recommendation because the quality of evidence was low, and the net benefit between women who were physically active and those who were not was small.

^b This was a strong recommendation because despite low quality evidence supporting physical activity during pregnancy for women categorized as overweight or obese, there was evidence from randomized controlled trials demonstrating an improvement in gestational weight gain and blood glucose, despite low quality evidence supporting physical activity during pregnancy for women categorized as overweight or obese.

^c Moderate-intensity physical activity is intense enough to noticeably increase heart rate; a person can talk but not sing during activities of this intensity. Examples of moderate-intensity physical activity include brisk walking, water aerobics, stationary cycling (moderate effort), resistance training, carrying moderate loads, and household chores (e.g., gardening, washing windows).

^d This was a weak recommendation because urinary incontinence was not rated as a “critical” outcome and the evidence was low quality.

^e This was a weak recommendation because: 1) the quality of evidence was very low; and 2) although harms were investigated, there was limited available information to inform the balance of benefits and harms. This recommendation was primarily based on expert opinion.

Quality of the evidence

The quality of the evidence refers to the level of confidence in the evidence, and it ranges from very low to high.

High quality: The Guideline Consensus Panel (GCP) is very confident that the estimated effect of physical activity on the health outcome is close to the true effect.

Moderate quality: The GCP is moderately confident in the estimated effect of physical activity on the health outcome. The estimate of the effect is likely to be close to the true effect, but there is a possibility that it is substantially different.

Low quality: The GCP's confidence in the estimated effect of physical activity on the health outcome is limited. The estimate of the effect may be substantially different from the true effect.

Very low quality: The GCP has very little confidence in the estimated effect of physical activity on the health outcome. The estimate of the effect is likely to be substantially different from the true effect.

Contraindications

All pregnant women can participate in physical activity throughout pregnancy with the exception of those who have contraindications (Table 2). Women with absolute contraindications may continue their usual activities of daily living, but should not participate in more strenuous activities. Women with relative contraindications should discuss the advantages and disadvantages of moderate-to-vigorous physical activity (up to 80% maximum) with their obstetric care provider prior to participation.

Table 2: List of absolute and relative contradictions to exercise throughout pregnancy

Absolute contraindications to exercise are the following:	Relative contraindications to exercise are the following:
<ul style="list-style-type: none">• ruptured membranes• premature labour• unexplained persistent vaginal bleeding• placenta previa after 28 weeks gestation• preeclampsia• incompetent cervix• intrauterine growth restriction• high-order multiple pregnancy (e.g., triplets)• uncontrolled Type I diabetes• uncontrolled hypertension• uncontrolled thyroid disease• other serious cardiovascular respiratory or systemic disorder	<ul style="list-style-type: none">• recurrent pregnancy loss• gestational hypertension• history of spontaneous preterm birth• mild/moderate cardiovascular or respiratory disease• symptomatic anemia• malnutrition• eating disorder• twin pregnancy after the 28th week• other significant medical conditions

Strength of the recommendations

The GRADE system was utilized to evaluate the strength of each recommendation.²¹ Recommendations are rated as strong or weak based on the:

- 1) balance between benefits and harms;
- 2) overall quality of the evidence;
- 3) importance of outcomes, i.e., values and preferences of pregnant women;
- 4) use of resources, i.e., cost;
- 5) impact on health equity;
- 6) feasibility; and
- 7) acceptability.

A strong recommendation means that most or all pregnant women will be best served by the recommended course of action. However, a weak recommendation means that not all pregnant women will be best served by the recommended course of action; there is a need to consider other factors such as the individual's circumstances, preferences, values, resources available, or setting. Consultation with an obstetric care provider may assist in decision-making.

Conclusion

This Guideline provides evidence-based recommendations regarding physical activity throughout pregnancy in the promotion of maternal, fetal, and neonatal health. Through use of these recommendations, practitioners are able to provide clear and achievable targets for women to be physically active during their pregnancies. The evidence strongly supports that by encouraging pregnant women to meet these recommendations, both mother and baby will experience significant short- and long-term health benefits.

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References

1. Evenson KR, Wen F. Prevalence and correlates of objectively measured physical activity and sedentary behavior among US pregnant women. *Prev Med.* 2011;53(1-2):39-43. doi: 10.1016/j.ypmed.2011.04.014.
2. Lavery J, Friedman A, Keyes K, Wright J, Ananth C. Gestational diabetes in the United States: temporal changes in prevalence rates between 1979 and 2010. *BJOG: An International Journal of Obstetrics & Gynaecology.* 2017;124(5):804-813.
3. Wallis AB, Saftlas AF, Hsia J, Attrash HK. Secular trends in the rates of preeclampsia, eclampsia, and gestational hypertension, United States, 1987-2004. *American Journal of Hypertension.* 2008;21(5):521-526.
4. Davenport MH, Ruchat S-M, Mottola MF, et al. 2019 Canadian guideline for physical activity throughout pregnancy: methodology. *Journal of Obstetrics and Gynaecology Canada.* 2018:S1701-2163(1718)30700-X. doi: 10.1016/j.jogc.2018.09.004.
5. Brouwers MC, Kho ME, Browman GP, et al. AGREE II: advancing guideline development, reporting, and evaluation in health care. *Prev Med.* 2010;51(5):421-424. doi: 10.1016/j.ypmed.2010.08.005.
6. Mottola MF, Davenport MH, Ruchat S-M, et al. No. 367-2019 Canadian guideline for physical activity throughout pregnancy. *Journal of Obstetrics and Gynaecology Canada.* 2018;40(11):1549-1559. doi: 10.1016/j.jogc.2018.07.001.
7. Mottola MF, Davenport MH, Ruchat S-M, et al. N° 367-2019 Lignes directrices Canadiennes sur l'activité physique durant la grossesse. *Journal of Obstetrics and Gynaecology Canada.* 2018;40(11):1560-1570. doi: 10.1016/j.jogc.2018.09.003.
8. Mottola MF, Davenport MH, Ruchat S-M, et al. 2019 Canadian guideline for physical activity throughout pregnancy. *Br J Sports Med.* 2018;52(21):1339-1346. doi: 10.1136/bjsports-2018-100056.
9. Davenport MH, McCurdy AP, Mottola MF, et al. Impact of prenatal exercise on both prenatal and postnatal anxiety and depressive symptoms: a systematic review and meta-analysis. *Br J Sports Med.* 2018;52(21):1376-1385. doi: 10.1136/bjsports-2018-099697.
10. Davenport MH, Ruchat SM, Poitras VJ, et al. Prenatal exercise for the prevention of gestational diabetes mellitus and hypertensive disorders of pregnancy: a systematic review and meta-analysis. *Br J Sports Med.* 2018;52(21):1367-1375. doi: 10.1136/bjsports-2018-099355.
11. Davenport MH, Ruchat SM, Sobierajski F, et al. Impact of prenatal exercise on maternal harms, labour and delivery outcomes: a systematic review and meta-analysis. *Br J Sports Med.* 2018. doi: 10.1136/bjsports-2018-099821.
12. Ruchat SM, Mottola MF, Skow RJ, et al. Effectiveness of exercise interventions in the prevention of excessive gestational weight gain and postpartum weight retention: a systematic review and meta-analysis. *Br J Sports Med.* 2018;52(21):1347-1356. doi: 10.1136/bjsports-2018-099399.
13. Davenport MH, Nagpal TS, Mottola MF, et al. Prenatal exercise (including but not limited to pelvic floor muscle training) and urinary incontinence during and following pregnancy: a systematic review and meta-analysis. *Br J Sports Med.* 2018;52(21):1397-1404. doi: 10.1136/bjsports-2018-099780.
14. Davenport MH, Marchand AA, Mottola MF, et al. Exercise for the prevention and treatment of low back, pelvic girdle and lumbopelvic pain during pregnancy: a systematic review and meta-analysis. *Br J Sports Med.* 2018. doi: 10.1136/bjsports-2018-099400.
15. Davenport MH, Meah VL, Ruchat SM, et al. Impact of prenatal exercise on neonatal and childhood outcomes: a systematic review and meta-analysis. *Br J Sports Med.* 2018;52(21):1386-1396. doi: 10.1136/bjsports-2018-099836.
16. Davenport MH, Kathol AJ, Mottola MF, et al. Prenatal exercise is not associated with fetal mortality: a systematic review and meta-analysis. *Br J Sports Med.* 2018. doi: 10.1136/bjsports-2018-099773.
17. Davenport MH, Sobierajski F, Mottola MF, et al. Glucose responses to acute and chronic exercise during pregnancy: a systematic review and meta-analysis. *Br J Sports Med.* 2018;52(21):1357-1366. doi: 10.1136/bjsports-2018-099829.
18. Davenport MH, Yoo C, Mottola MF, et al. Effects of prenatal exercise on incidence of congenital anomalies and hyperthermia: a systematic review and meta-analysis. *Br J Sports Med.* 2018. doi: 10.1136/bjsports-2018-099653.
19. Mottola MF, Nagpal TS, Bgeginski R, et al. Is supine exercise associated with adverse maternal and fetal outcomes? A systematic review. *Br J Sports Med.* 2018. doi: 10.1136/bjsports-2018-099919.
20. Skow RJ, Davenport MH, Mottola MF, et al. Effects of prenatal exercise on fetal heart rate, umbilical and uterine blood flow: a systematic review and meta-analysis. *Br J Sports Med.* 2018. doi: 10.1136/bjsports-2018-099822.
21. Guyatt GH, Oxman AD, Sultan S, et al. GRADE guidelines: 9. Rating up the quality of evidence. *J Clin Epidemiol.* 2011;64(12):1311-1316. doi: 10.1016/j.jclinepi.2011.06.004.

