

PART 1: AEROBIC EXERCISE DURING PREGNANCY

By Linda May, Ph.D.

While the benefits of aerobic exercise are widely known, many women are unsure if exercising while pregnant is feasible. Knowledge of how exercise affects mother and child has increased greatly through the inquiries of investigators. Through their efforts, researchers have determined the alterations normally associated with aerobic exercise are not detrimental to pregnancy outcomes. Having answered the question of if aerobic exercise during pregnancy is safe, the next step for academia has been to establish guidelines for physical activity during gestation.

Since 1985, the American Congress of Obstetricians and Gynecologists (ACOG) have updated aerobic exercise and pregnancy guidelines. All women should consult their physician to verify they are able to participate in aerobic exercise while pregnant. Prior to initiating an exercise program, pregnant clients should first complete a brief screening questionnaire, such as the PARmed-X, which is a free download (<http://www.csep.ca/forms.asp>). This documentation enables you to determine your client's health status. All exercise professionals should know the absolute contraindications to exercise during pregnancy, listed in ACOG Committee Opinion #267.¹ Additionally, exercise trainers need to know relative contraindications to enable them to discuss benefits to risks with their clients, and determine how exercise may influence pregnancy outcomes.¹ Lastly, all fitness instructors should know when to terminate exercise immediately (*i.e.*, vaginal bleeding, difficulty breathing, dizziness, headache, chest pain, calf pain/swelling, preterm labor, amniotic fluid leakage).¹ Maintain a file for each pregnant client that includes 1) signed physician approval note, 2) completed screening questionnaire, 3) exercise program description, and 4) exercise progress notes.

ACUTE RESPONSE TO AEROBIC EXERCISE WHILE PREGNANT

It is important to understand the acute physiological responses to exercise when pregnant. Although utero-placental blood flow decreases slightly, the increased oxygen transport capacity^{3, 4, 10} with increased plasma and red cell volume maintains adequate nutrient and oxygen to the developing fetus.^{3, 4, 10} Additionally, the hormone changes associated with acute exercise are not associated with fetal demise, premature labor, or adverse pregnancy outcomes.⁵ Although exercise alters maternal blood glucose levels, glucose is maintained to the developing fetus.⁶ The normal hyperthermic response of exercise is not teratogenic (leading to birth defects) since the mother has a lower body temperature, increased skin blood flow, and a lower sweating threshold to improve heat dissipation away from the fetus.⁵ A woman's altered center of gravity and increased joint laxity is not associated with falls, or injuries during exercise.⁵ Lastly, stresses from high impact pounding as in aerobics or running, does not cause adverse pregnancy outcomes (*i.e.*, rupture membranes, preterm labor, fetal injury/demise, spontaneous abortion, malformations, placental complications, etc.).^{5, 7} Therefore, acute physiological responses from aerobic exercise are safe while pregnant.

BENEFITS OF REGULAR AEROBIC EXERCISE THROUGHOUT PREGNANCY

Current studies demonstrate regular participation in aerobic activity throughout gestation is associated with improved outcomes for mother and baby. The mother enjoys improved mood/self esteem, appropriate weight gain (decreased fat deposition), improved cardiovascular system, improved muscle tone, improved posture, and decreased aches of pregnancy.¹ Further, her continual activity can improve her "performance" during labor and delivery. Studies show that regular aerobic exercise increased the likelihood of delivery close to the estimated due date, decreased labor and delivery time, and quicker recovery.⁵ There are also "training effects" for the baby. For example, regular maternal exercise at or above ACOG minimum recommendations leads to improved fetal cardiac autonomic control, similar to the lower resting heart rate seen in an adult exercise trained response.¹³ This improved control of the fetal heart persists after birth.¹⁴ Studies found offspring exposed to maternal exercise in utero were leaner, with improved academic and athletic performance as children and young adults compared to non-exposed counterparts.¹¹ These findings must be interpreted with caution since outcomes can differ based on frequency, intensity, time, and type of exercise.

AEROBIC EXERCISE GUIDELINES

Whether women are exercise veterans or just getting started, the same questions are asked: How often, how hard, and how long can one exercise during pregnancy? What aerobic exercises are safe during pregnancy? Women are often likely to believe the outdated claims or myths from magazines, family, and friends instead of their physicians or exercise professional.⁸ Due to the breadth of research in this area, current federal, ACOG, and American College of Sports Medicine (ACSM) guidelines recommend pregnant women to participate in 30 minutes or more of moderate to vigorous aerobic exercise, 3 or more days of the week, in the absence of pregnancy complications. Women who were previously active can continue an aerobic exercise regimen, even above these minimum recommendations (*i.e.*, >30 min, 7 days per week, moderate to vigorous activity). However, a large retrospective cohort study of Danish women finds first trimester aerobic exercise of ≥ 75 minutes per week could be associated with an increased risk of miscarriage.¹² The ideal exercise time range during the first trimester of pregnancy seemed to be 45 to 74 minutes per week; as a retrospective study, however, the authors cautioned that recall bias may have influenced these values. In the second and third trimesters there were no associations with miscarriages and amount of exercise.¹² Additionally, one study suggests too much exercise (>5 times per week), similar to not enough (≤ 2 times per week), may be associated with an increased likelihood of delivering a small-for-gestational age baby.² Though these findings have not been found in other studies, small-for-gestational age is considered a risk factor for obesity and cardiovascular disease later in life, thus the safest

frequency of an exercise program should be 3 to 5 times per week.² Although competitive and highly trained athletes might safely train harder than most women during pregnancy, for the average fit individuals a rating of perceived exertion (RPE) of 12 to 14 (moderate) is suggested, but this may decrease in late pregnancy. For women who were sedentary prior to conceiving, it is suggested they begin with 5 minutes of comfortable activity (*i.e.*, utilize the talk test, ≤ 12 RPE) for 3 days of the week, and add 5 minutes every week if she can talk comfortably while exercising and has no pain or symptoms. Once she reaches the minimum of 30 minute sessions, then an additional day can be added, if desired. Always precede and succeed the aerobic session with a brief warm-up/cool-down session (*i.e.*, light stretching, slow walk). Therefore, all pregnant women can exercise most days of the week, at moderate to vigorous intensity, and aim to achieve at least 30 minutes per session.

Once appropriate frequency, intensity, and time are established, the mode(s) of aerobic exercise is chosen. Some exercises should be avoided while others only need modifications. As the pregnant abdomen enlarges, it is advisable to avoid certain aerobic sports (*i.e.*, ice hockey, ball sports, court sports, gymnastics, horseback riding, water skiing, martial arts, etc.); though there are no findings of adverse pregnancy outcomes⁵ and the risk of abdominal injury is very low.⁹ For modifications, ACOG recommends snow skiing on safe slopes only. While outdoor skiing can be switched to indoor cross country skiing. Other activities such as road cycling should be modified to stationary cycling or spinning.

Typically, exercise veterans can continue their regular aerobic routine, as long as their current aerobic activity is not one that may cause fetal trauma. For beginners, choose a low risk, comfortable, enjoyable activity. Low risk aerobic activities include swimming, walking, jogging, spinning/cycling, aerobics classes, most aerobic equipment (*i.e.*, stair climber, elliptical, rowing). Avoid activities that may decrease maternal circulation by compressing the inferior vena cava (*i.e.*, Crossrobics). Swimming is shown to be the safest aerobic activity throughout pregnancy, due to the low impact nature and improved thermoregulation.¹² The most common aerobic activity during pregnancy is walking, as it involves little expense and can be done anywhere, at varying intensities. Late pregnancy hormonal changes causing joint laxity may necessitate further modification of aerobic activity. Allow your pregnant clientele to choose one or more safe aerobic exercises that she feels comfortable doing and enjoys.

As the pregnant body continues to change, other modifications must be considered to ensure a woman's participation in exercise is safe and comfortable. In order to maintain a heat gradient away from the fetus, women must exercise in an environment that is comfortable, and must maintain fluid satiety. Women should not wear any restrictive clothing. With the augmentation of breast tissue and the nature of aerobic activity, women should wear a supportive bra and not a sports bra. To support their growing belly, women may require a belly band or sling during their exercise activity. Ideally, women should feel comfortable while exercising.

SUMMARY

Most importantly, exercise during a healthy, uncomplicated pregnancy is safe, regardless of fitness level. Before beginning an exercise program for any pregnant client, keep files containing obstetrician permission, completed screening questionnaire, exercise program description, and exercise progress notes. Make sure you and your client know when to terminate an exercise session. Participation in consistent, aerobic

exercise throughout the pregnancy is beneficial for mother and baby. These benefits can motivate women to maintain their program throughout gestation. Additionally, make sure your client is comfortable and hydrated during exercises. Also ensure the frequency, intensity, time, and type of exercise is appropriate while allowing maintenance/gains in fitness. Ultimately, following a regular aerobic exercise program will provide benefits during and even after the pregnancy.

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