

Exercise in Pregnancy

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An increasing number of adolescent females are participating in recreational and competitive sports, strength training and other fitness activities. During pregnancy they may want to remain physically active and continue some of these activities. Other adolescents who were previously sedentary may want to begin an exercise program as part of a healthy lifestyle.

SAFETY OF EXERCISE DURING PREGNANCY

- Observational and interventional studies support the tolerance and safety of moderate exercise in healthy pregnant individuals.¹
- The fetus is protected from potentially harmful effects of maternal exercise (e.g., hyperthermia, decreased uterine blood flow and oxygen delivery, decreased carbohydrate availability and uterine contractions) by maternal physiologic adaptations to pregnancy.^{1,2}
- Exercise in normal (uncomplicated) pregnancies has not been associated with compromised fetal growth and development, premature labor or delivery complications.¹
- Mild to moderate exercise in pregnancy has been associated with a neutral or beneficial effect on pregnancy outcome.¹
- Healthy, well-nourished adolescents without obstetrical

or medical complications can safely exercise with few restrictions during pregnancy.^{1,3}

- Adolescents who are trained athletes prior to pregnancy can continue to exercise throughout pregnancy with modifications made as needed.⁴
- Adolescents who were not exercising regularly prior to becoming pregnant can safely begin an exercise program during pregnancy.¹

POTENTIAL BENEFITS OF EXERCISE DURING PREGNANCY

Physical exercise enhances muscular strength, endurance, flexibility and cardiovascular health. Additional benefits of exercise during pregnancy,^{1,4-6} which may be especially important to the adolescent, are listed in Table 1.

PHYSIOLOGIC CONSIDERATIONS AFFECTING EXERCISE DURING PREGNANCY

Physiologic changes associated with pregnancy may affect exercise tolerance and safety and must be considered when modifying or developing prenatal exercise programs.

TABLE 1
**Potential Benefits of Exercise
 During Pregnancy**

Fewer physical discomforts (e.g., fatigue, nausea, leg cramps, backache, constipation, round ligament pain, shortness of breath)

Decreased incidence of operative delivery, gestational hypertension and preeclampsia

Improved blood glucose control in gestational diabetes

Shorter active phase of labor

Improved self esteem and body image

Decreased stress and anxiety and improved sleep

Less isolation from nonpregnant peers

Increased placental weight, blood flow and infant birthweight

Maintenance or improvement of fitness level

Less likelihood of excessive weight gain

Fewer stretch marks

Improved posture

Faster postpartum recovery

- Beginning early in pregnancy, relaxin softens and stretches connective tissue, resulting in laxity and instability of ligaments and joints and increased risk of sprains and strains.⁷
- The enlarging uterus and breasts and growing fetus shift the center of gravity, resulting in balance problems, increased lumbar lordosis (sway back), and greater strain on the lower back and hips.⁷
- Weight gain may place additional stress on joints and make movement more difficult.¹
- In later pregnancy, edema may limit range of motion and cause nerve compression.¹
- Pressure exerted on the vena cava by the enlarging uterus may result in decreased cardiac output and reduced blood flow to the uterus when exercising on the back after the first trimester.⁸ Symptoms may include dizziness and shortness of breath.

- Hypoglycemia can occur more readily, especially in later gestation, or with prolonged, strenuous exercise, since carbohydrate utilization is greater in pregnancy.^{1, 3, 7}
- Increased resting oxygen consumption lowers oxygen availability for aerobic exercise in pregnancy.³

GUIDELINES FOR EXERCISE DURING PREGNANCY

- Prenatal exercise programs must be individualized according to the adolescent's health status, interests and fitness level. Desirable components include aerobic conditioning, strength training and flexibility exercises.¹
- Regular exercise (at least three times per week) is preferable to intermittent activity or a sudden increase in exercise level, which can result in muscle strain.³
- Exercise sessions should begin with a warm-up and end with a cool-down and relaxation period (e.g., 10-15 minutes of slow walking or stationary cycling on low resistance followed by gentle stretching). This will reduce the risk of ligament and back strain, ensure a safe cardiovascular response, normalize metabolic rate and respiration and prevent pooling of blood in exercising muscles.⁷ After exercise, the adolescent should rise gradually from the floor to prevent dizziness.
- Exercises that require lying on the back should be avoided after the first trimester.³
- Exercise intensity should be light enough to allow conversation and prevent shortness of breath, fatigue, pain, and exhaustion.^{3, 8} Since resting heart rate increases and maximum heart rate decreases in pregnancy, monitoring target heart rate to determine exercise intensity is of limited usefulness.¹
- Fatigue and discomfort may be less likely if exercise intensity is decreased in later pregnancy (e.g., exercising more slowly with fewer repetitions, or engaging in less strenuous activities such as doubles tennis instead of singles, walking instead of running).
- Exercise sessions should be short enough to prevent hypoglycemia, fatigue and discomfort (e.g., 20-30 minutes of moderate aerobic activity, 3-5 times per week).¹

- Running may require shorter distances, slower speeds, flatter terrain and more frequent rest periods.
- Strength training should be limited to 2-3 times per week using light weights (2-5 kg) and fewer repetitions. Heavy free weights or heavy resistance on weight machines could increase the risk of spinal disc injury⁷ and intra-abdominal pressure. Straining and breath-holding should be avoided.⁷
- Exercise activities that do not require a high degree of balance and coordination, quick movements, or involve the risk of falling or fetal trauma are considered safe during pregnancy. (See Table 2).
- Water skiing could result in forceful entry of water into the uterus, which could result in miscarriage.⁹
- Scuba-diving may be associated with decompression disease, gas embolism, and in the first trimester, risk of fetal malformation.¹⁰

EXERCISE ENVIRONMENT

- Particularly during the first trimester, overheating (which may have teratogenic effects on the fetus) should be avoided. Exercise should not be done while febrile or in hot, humid weather. Saunas or hot tubs may also increase the risk of hyperthermia and should be avoided.⁷ Exercising in light clothing during a cooler time of day outdoors, or with a fan indoors will help prevent dehydration and hyperthermia in hot weather.^{3, 8}
- A tightly carpeted or wooden floor will reduce the risk of slipping.
- Walking or running on a cushioned track or grass will increase comfort and reduce the risk of injury.
- Well-cushioned shoes that provide good support will aid balance and increase comfort.

TABLE 2
Examples of Activities
Considered Safe During Pregnancy

Walking	Rowing
Power walking	Dancing
Jogging	Prenatal exercise classes
Running	Cross country skiing
Swimming	Snorkeling
Water aerobics	Tennis
Water jogging	Bowling
Low impact aerobics	Golfing
Stationary cycling	Light weight training

- The pelvic tilt will help strengthen abdominal muscles, and decrease round ligament pain and lumbar lordosis. Instruct the adolescent to stand, lie or sit with feet hip-distance apart and knees slightly bent, while the muscles of the abdomen and buttocks are contracted. The pelvis is thrust forward and the pelvic bone is rolled upward.
- Exercises which strain the lower back, stress ligaments, cause knee trauma or promote separation of the of the symphysis pubis (junction of pubic bone) should be avoided. These include full sit-ups, sitting cross-legged, double leg lifts, side leg swings, toe touches, squatting, deep knee bends and bridging (lifting buttocks off floor from lying position).⁷
- Jerking motions, hopping, jumping, twisting or sudden changes in direction are contraindicated. Joints should not be extended beyond the normal range of motion.⁷
- Ample fluid intake is essential to prevent dehydration, which occurs more readily in pregnancy (10-12 cups per day, including 2 cups before exercise, 1 cup every 15 minutes during, and 2-3 cups after exercise).⁸ Thirst may be depressed during exercise and cannot be relied upon to assure an adequate fluid intake. Clear, light-colored urine is an indicator of adequate hydration.
- An increased intake of carbohydrate will reduce the risk of hypoglycemia. Complex carbohydrates (e.g., bread, pasta, cereal) or milk, fruit or fruit juice should be consumed 1-2 hours before, and within 1 hour after exercise.
- Energy intake should be adequate to support exercise and promote optimal weight gain and fetal growth. Weight loss should not occur with exercise during pregnancy. The energy required for weight-bearing exercise (e.g., walking, running) increases with gestational weight gain.

NUTRITION GUIDELINES

EXERCISE PRECAUTIONS

The adolescent should be cautioned to stop exercising and contact her health care provider if any of the following occur:⁷

- Dizziness
- Muscle weakness
- Shortness of breath
- Chest pain or tightness
- Vaginal bleeding or fluid loss
- Uterine contractions
- Headache
- Abdominal pain
- Absent fetal movement

CONTRAINDICATIONS TO EXERCISE

Adolescents with any of the following conditions should be advised not to exercise during pregnancy:^{3, 7, 8}

- Pregnancy-induced hypertension
- Preterm rupture of membranes
- Preterm labor (current or previous)
- Incompetent cervix/cerclage
- Persistent second or third trimester bleeding
- Intrauterine growth retardation
- Severe anemia
- Placenta previa

Adolescents with chronic hypertension or active thyroid, cardiac, vascular or pulmonary disease should be evaluated individually to determine if exercise is advisable.³

ASSESSMENT

Obtaining the following information at the initial visit will be helpful in providing guidance to the adolescent who exercises during pregnancy.

- Prepregnancy exercise program, including:
 - Types of exercise such as competitive and recreational sports activities, strength training, other school or leisure-related activities (e.g., cheerleading, walking, swimming, cycling, exercise/dance classes)

- Frequency of exercise
- Duration of exercise
- Intensity of exercise

- Current exercise patterns (assess as above)
- Goals and expectations for continuing or beginning physical activity during pregnancy

COUNSELING

The following information should be provided to adolescents who wish to begin or remain physically active during pregnancy:

- Potential benefits of exercise during pregnancy
- Physiologic changes associated with pregnancy that affect exercise comfort and safety
- Guidelines for exercise during pregnancy and the postpartum period
- Nutrition guidelines for exercise during pregnancy
- Advice to avoid or discontinue exercise if any of the above contraindications are present
- Warning signs that exercise sessions should be stopped

POSTPARTUM EXERCISE CONSIDERATIONS

- Musculoskeletal and cardiovascular changes associated with pregnancy gradually reverse during the postpartum period and continue to affect the safety and comfort of exercise.⁷
- Ligaments and joints remain softened and at increased risk of injury for up to 12 weeks after delivery.⁷
- Cardiovascular changes may continue to affect exercise tolerance for 4-6 weeks postpartum.³
- The adolescent should be advised to gradually return to her prepregnancy exercise level as tolerated.³

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