



ACE Group Fitness Instructor University Curriculum

Chapter 7: Exercise and Pregnancy



Learning Objectives

- Upon completion of this chapter, you will be able to:
 - Discuss the benefits, contraindications, and risk factors associated with exercise during pregnancy
 - Explain physiological adaptations to pregnancy
 - Discuss fetal risks associated with exercise
 - Conceptualize musculoskeletal system imbalances and dysfunctions associated with pregnancy
 - Describe cardiovascular exercise guidelines for pregnant women
 - Provide strength-training guidelines for pregnant women
 - Offer exercise-programming suggestions and modifications for pregnant women
 - Take into account postnatal exercise program considerations

Introduction

- The number of women who exercise during pregnancy has increased steadily in recent years.
- A prenatal exercise program should be based on many factors, pregnancy being only one of them.
- Other factors to consider:
 - The pregnant exerciser's goals
 - Level of experience
 - State of training
 - Apprehensions
 - Expectations
 - Motivation



Benefits of Prenatal Exercise

- The American College of Obstetricians and Gynecologists (ACOG) recommends exercise for pregnant women.
 - Pregnant women who exercise can maintain or even improve fitness.
- Exercise during pregnancy can potentially:
 - Reduce common prenatal discomforts
 - Assist in controlling pregnancy-related health disorders
 - Inhibit excessive weight gain
 - Enhance psychological well-being
 - Promote a faster recovery from labor

Risks of Prenatal Exercise

- Healthy women with uncomplicated pregnancies tend to not need to limit their exercise for fear of adverse effects.
- However, there are some instances when prenatal exercise is contraindicated.
- ACOG has established absolute and relative contraindications to aerobic exercise during pregnancy.
 - GFIs should require a physician's clearance prior to exercise.
 - Tables listing these contraindications are presented on the following two slides.



Absolute Contraindications to Aerobic Exercise During Pregnancy

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- Hemodynamically significant heart disease
- Restrictive lung disease
- Incompetent cervix/cerclage
- Multiple gestation at risk for premature labor
- Persistent second- or third-trimester bleeding
- Placenta previa after 26 weeks of gestation
- Premature labor during the current pregnancy
- Ruptured membranes
- Preeclampsia/pregnancy-induced hypertension

Exercise during pregnancy and the postpartum period. ACOG Committee Opinion No. 267. American College of Obstetricians and Gynecologists. *Obstetrics and Gynecology*, 2002; 99, 171–173.

Relative Contraindications to Aerobic Exercise During Pregnancy

Relative Contraindications to Aerobic Exercise During Pregnancy

- Severe anemia
- Unevaluated maternal cardiac arrhythmia
- Chronic bronchitis
- Poorly controlled type 1 diabetes
- Extreme morbid obesity
- Extreme underweight (body mass index <12)
- History of extremely sedentary lifestyle
- Intrauterine growth restriction in current pregnancy
- Poorly controlled hypertension
- Orthopedic limitations
- Poorly controlled seizure disorder
- Poorly controlled hyperthyroidism
- Heavy smoker

Exercise during pregnancy and the postpartum period. ACOG Committee Opinion No. 267. American College of Obstetricians and Gynecologists. *Obstetrics and Gynecology*, 2002; 99, 171–173.

Risks of Prenatal Exercise

- ACOG has established:
 - Reasons to discontinue exercise and seek medical advice
 - Warning signs to cease exercise while pregnant
- GFIs should familiarize themselves and their participants with these guidelines.
 - Tables providing these guidelines are presented on the next two slides.



Reasons to Discontinue Exercise and Seek Medical Advice

Reasons to Discontinue Exercise and Seek Medical Advice

- Any sign of bloody discharge from the vagina
- Any “gush” of fluid from the vagina (premature rupture of membranes)
- Sudden swelling of the ankles, hands, or face (possible preeclampsia)
- Persistent, severe headaches and/or visual disturbances (possible hypertension)
- Unexplained spell of faintness or dizziness
- Swelling, pain, and redness in the calf of one leg (possible phlebitis)
- Elevation of pulse rate or blood pressure that persists after exercise
- Excessive fatigue, palpitations, or chest pain
- Persistent contractions (more than six to eight per hour) that may suggest onset of premature labor
- Unexplained abdominal pain
- Insufficient weight gain [less than 1 kg/month (2.2 lb/month) during last two trimesters]

Exercise during pregnancy and the postpartum period. ACOG Committee Opinion No. 267. American College of Obstetricians and Gynecologists. *Obstetrics and Gynecology*, 2002; 99, 171–173.

Warning Signs to Cease Exercise While Pregnant

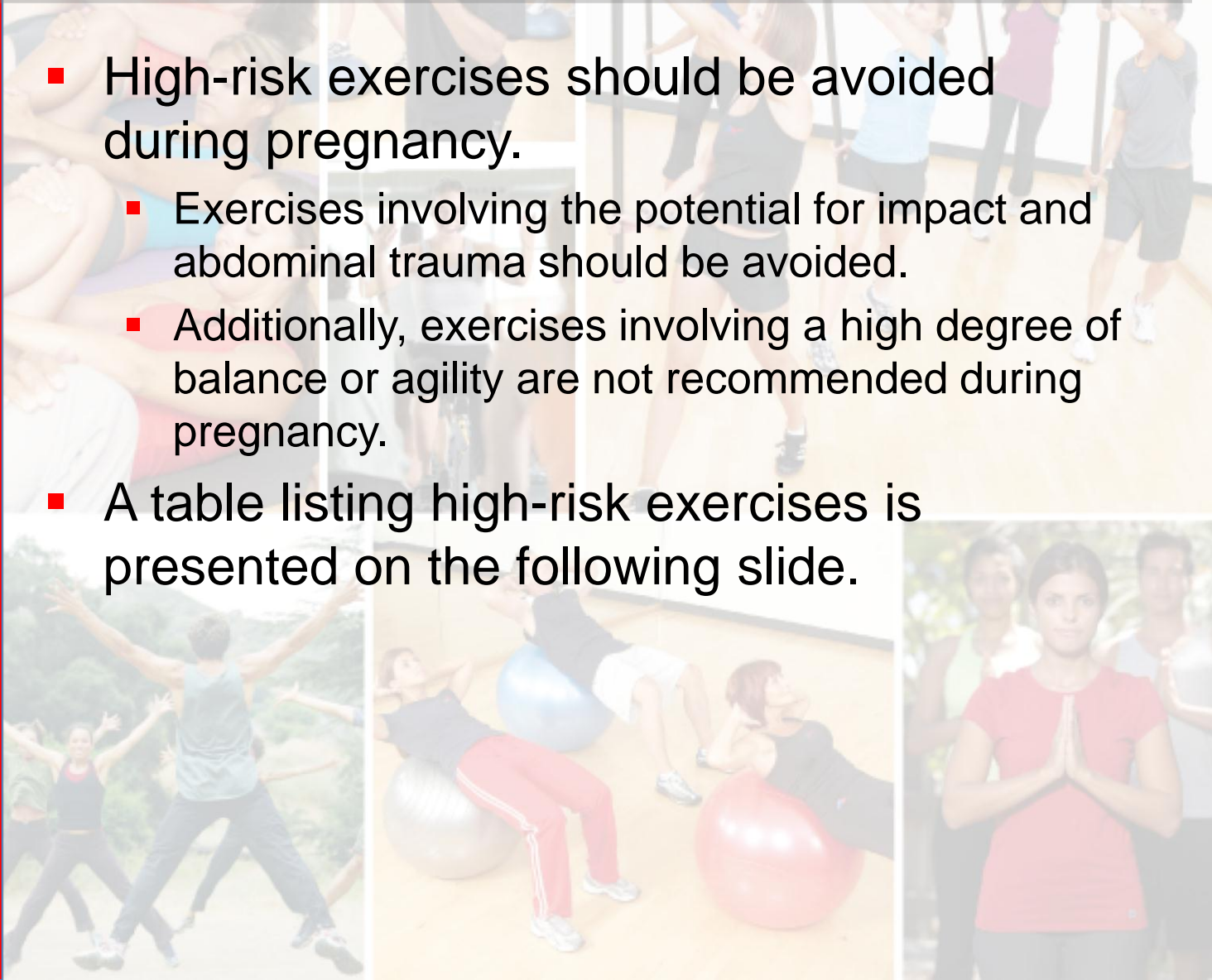
Warning Signs to Cease Exercise While Pregnant

- Vaginal bleeding
- Dyspnea prior to exertion
- Dizziness
- Headache
- Chest pain
- Muscle weakness
- Calf pain or swelling (need to rule out thrombophlebitis)
- Preterm labor
- Decreased fetal movement
- Amniotic fluid leakage

Exercise during pregnancy and the postpartum period. ACOG Committee Opinion No. 267. American College of Obstetricians and Gynecologists. *Obstetrics and Gynecology*, 2002; 99, 171–173.

Exercises to Avoid During Pregnancy

- High-risk exercises should be avoided during pregnancy.
 - Exercises involving the potential for impact and abdominal trauma should be avoided.
 - Additionally, exercises involving a high degree of balance or agility are not recommended during pregnancy.
- A table listing high-risk exercises is presented on the following slide.

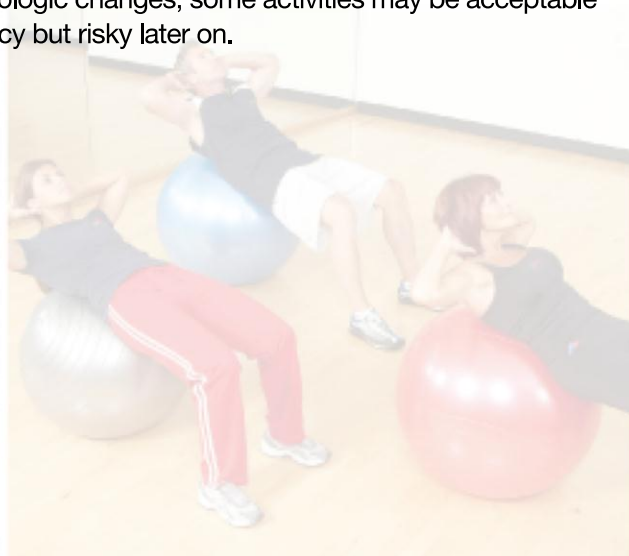
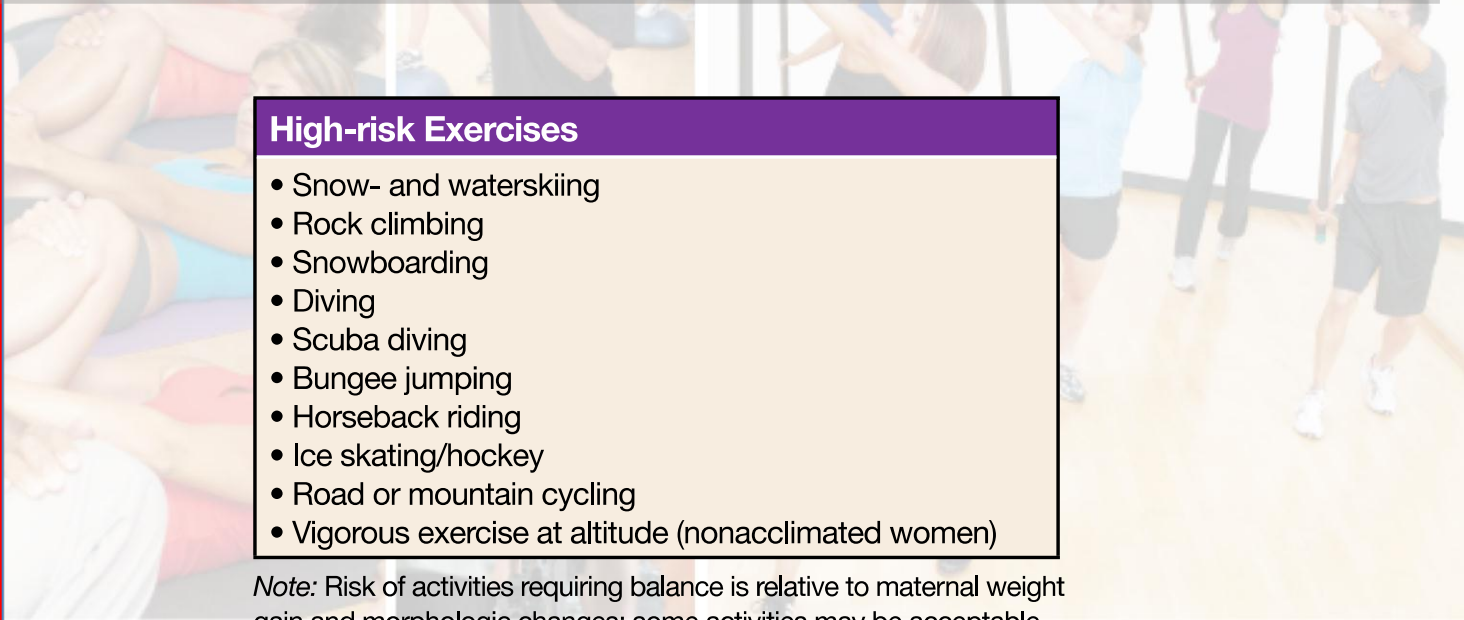


High-risk Exercises

High-risk Exercises

- Snow- and waterskiing
- Rock climbing
- Snowboarding
- Diving
- Scuba diving
- Bungee jumping
- Horseback riding
- Ice skating/hockey
- Road or mountain cycling
- Vigorous exercise at altitude (nonacclimated women)

Note: Risk of activities requiring balance is relative to maternal weight gain and morphologic changes; some activities may be acceptable early in pregnancy but risky later on.



Physiological Adaptations to Pregnancy

- Cardiovascular system
 - Pregnancy and exercise elicit many similar responses.
 - The heart and blood vessels must provide more oxygen to meet an increased need.
- Respiratory system
 - Pregnant women ventilate 50% more air per minute than nonpregnant women.
- Musculoskeletal system
 - Relaxin and progesterone are released to soften the ligaments around the joints.
 - Postural alignment is altered.

Physiological Adaptations to Pregnancy

- Venous return
 - Supine hypotension
 - Fetal hypoxia
- Weight gain
 - Important part of a healthy pregnancy
 - Exercise should not be used as a means to prevent healthy, normal weight gain during pregnancy.
 - A table listing the Institute of Medicine's weight gain recommendations during pregnancy is presented on the following slide.

Weight Gain Recommendations During Pregnancy

Weight Gain Recommendations During Pregnancy		
Prepregnancy Body Mass Index (kg/m ²)	Category	Recommended Weight Gain
<18.5	Underweight	28 to 40 lb (12.5 to 18.0 kg)
18.5–24.9	Normal weight	25 to 35 lb (11.5 to 16.0 kg)
25.0 to 29.9	Overweight	15 to 25 lb (7.0 to 11.5 kg)
>30.0	Obese	11 to 20 lb (5.0 to 9.0 kg)

Source: Institute of Medicine (2009). *Weight Gain During Pregnancy: Reexamining the Guidelines*.
<http://iom.edu/Reports/2009/Weight-Gain-During-Pregnancy-Reexamining-the-Guidelines.aspx>

Fetal Risks Associated With Exercise: Uterine-placental Blood Flow

- Theoretical areas of concern for the fetus during exercise have been suggested.
- Uterine-placental blood flow
 - Fetal hypoxia
 - Adaptations occur within the exercising mother
 - Oxygen delivery does not appear to be compromised
 - It appears that the fetus can adjust safely to reductions in blood flow resulting from moderate exercise bouts.

Fetal Risks Associated With Exercise: Carbohydrate Utilization

- Carbohydrate utilization
 - Pregnant women have lower fasting blood glucose levels.
 - Pregnant women utilize carbohydrate during exercise at a greater rate.
 - Hypoglycemia
 - Glucose intolerance
 - Gestational diabetes
- Pregnant women should eat frequently.



Fetal Risks Associated With Exercise: Thermoregulation

- Thermoregulation
 - Fetal hyperthermia
 - Febrile illness is associated with neural tube defects.
 - Potential to reverse the temperature gradient between mother and baby
 - Pregnant women have physiological adaptations that enhance thermoregulation during exercise.
- Participants should be advised to:
 - Exercise in a cool, well-ventilated, low-humidity environment
 - Drink plenty of cool water
 - Avoid very high-intensity activities

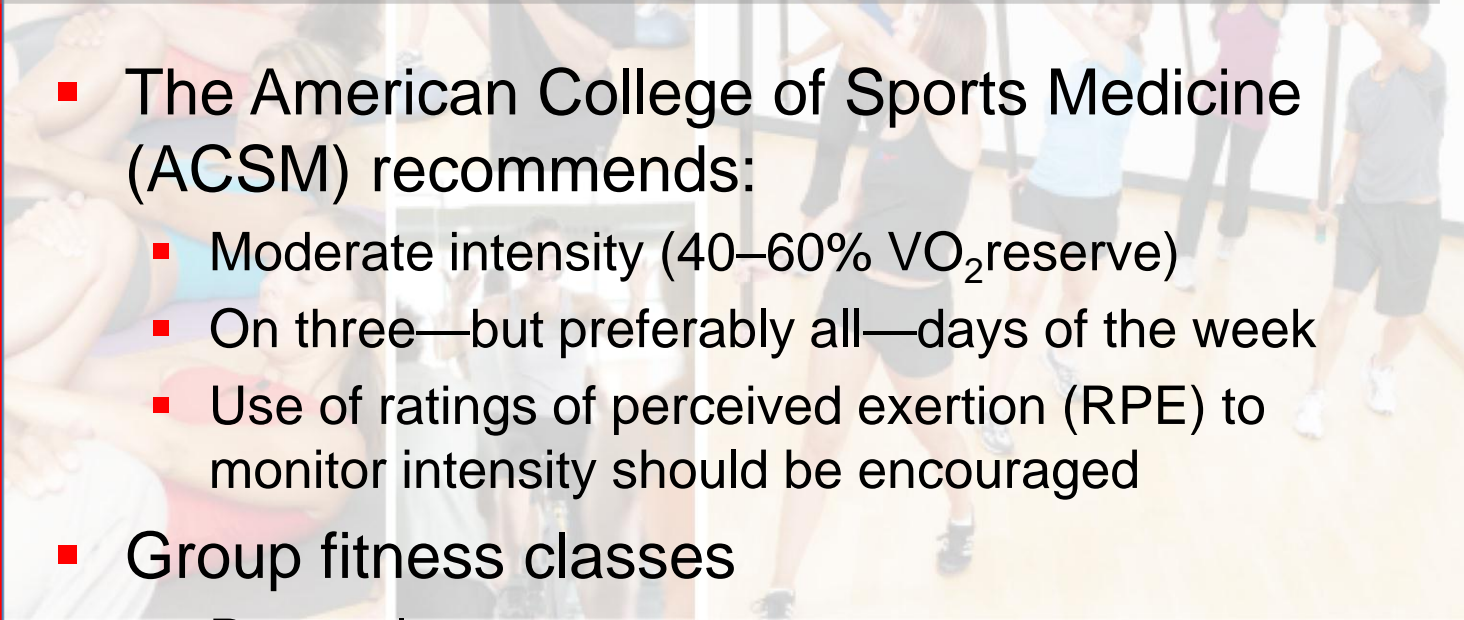
Musculoskeletal System Imbalances and Dysfunctions

- Muscle imbalances
 - Occur when posture is not in ideal alignment
 - Affected muscles are either “tight” or “weak”
- Common dysfunctions and irritations
 - Backache
 - Pelvic floor weakness
 - Diastasis recti
 - Round, inguinal, and broad ligament irritations
 - Pubic pain
 - Sacroiliac joint dysfunction
 - Sciatica
 - Nerve compression syndromes
 - Overuse syndromes
 - Muscle cramps



Cardiovascular Exercise Guidelines for Pregnant Women

- The American College of Sports Medicine (ACSM) recommends:
 - Moderate intensity (40–60% VO_2 reserve)
 - On three—but preferably all—days of the week
 - Use of ratings of perceived exertion (RPE) to monitor intensity should be encouraged
- Group fitness classes
 - Prenatal
 - Integrated
 - Aquatic
 - Cycling
 - Mind-body



Strength-training Guidelines for Pregnant Women

- ACSM recommends:
 - All major muscle groups
 - A resistance that allows for moderate fatigue within 12–15 repetitions
- Important considerations for pregnant exercisers:
 - Stay within a functional range of motion (ROM)
 - Avoid the Valsalva maneuver
 - Semirecumbent position (rather than supine position) is preferred after first trimester
 - Proper body mechanics are crucial

Strength-training Guidelines for Pregnant Women

- Specific areas of the body need special attention in the pregnant exerciser.
 - Neck
 - Shoulder girdle
 - Shoulder and elbow joints
 - Wrist joint
 - Low back
 - Abdominal wall
 - Pelvic floor
 - Hip flexors
 - Hip extensors
 - Hip abductors
 - Hip adductors
 - Quadriceps/knee extensors
 - Hamstrings/hip extensors and knee flexors
 - Ankle joint



General Programming Suggestions and Modifications

- GFIs may need to offer individualized modifications for pregnant participants.
- Maintaining proper body alignment is essential.
 - Many positions may need to be modified to account for comfort and safety.
- GFIs may need to experiment with different approaches to challenge pregnant participants appropriately.



Specific Programming Suggestions and Modifications

- Design longer warm-ups to soothe vulnerable areas.
- Demonstrate and emphasize proper alignment throughout class.
- Choose positions to give the participant the best workout within her comfort zone while maintaining proper body alignment.
- Modify certain exercise positions.
 - Replace supine positions with semirecumbent and side-lying positions.
 - Replace prone positions with an all-fours position or an elbows-and-knees position.

Postnatal Exercise

- Returning to exercise after delivery should be done slowly.
- After delivering a baby, a mother's priorities are to:
 - Bond with the baby
 - Resume Kegel exercises as soon as possible
- The postpartum return to exercise should be after the postpartum doctor's visit.
- Important considerations for postpartum exercise:
 - Postpartum musculoskeletal conditions
 - Resuming exercise after Caesarean delivery
 - Breastfeeding and exercise

Summary

- This chapter covered:
 - Benefits, contraindications, and risk factors associated with exercise during pregnancy
 - Physiological adaptations to pregnancy
 - Fetal risks associated with exercise
 - Musculoskeletal system imbalances and dysfunctions associated with pregnancy
 - Cardiovascular exercise guidelines for pregnant women
 - Strength-training guidelines for pregnant women
 - Exercise programming suggestions and modifications for pregnant women
 - Postnatal exercise program considerations