

# Pregnancy and Athletics

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# Disclaimer

I have no financial or non-financial relationship to this presentation.  
This is solely for educational purposes.

# Objectives

- To review the normal anatomic and physiologic changes that occur during pregnancy
- To explore the benefits and potential risks of an exercise program
- To review the considerations and recommendations of an exercise program
- To discuss examples of the exercise prescription and basic nutritional guidelines
- To briefly discuss NCAA guidelines and considerations for the pregnant student athlete

# Anatomic Changes of Pregnancy

- Embryo implantation
  - Not many specific signs at this stage although bleeding may occur
  - Uterine wall and placental connection with the embryo allows for nutrient uptake, gas exchange, and waste elimination through the mother's circulatory system
- Signs develop to signify pregnancy
  - Nausea/Vomiting
  - Fatigue
  - Cravings

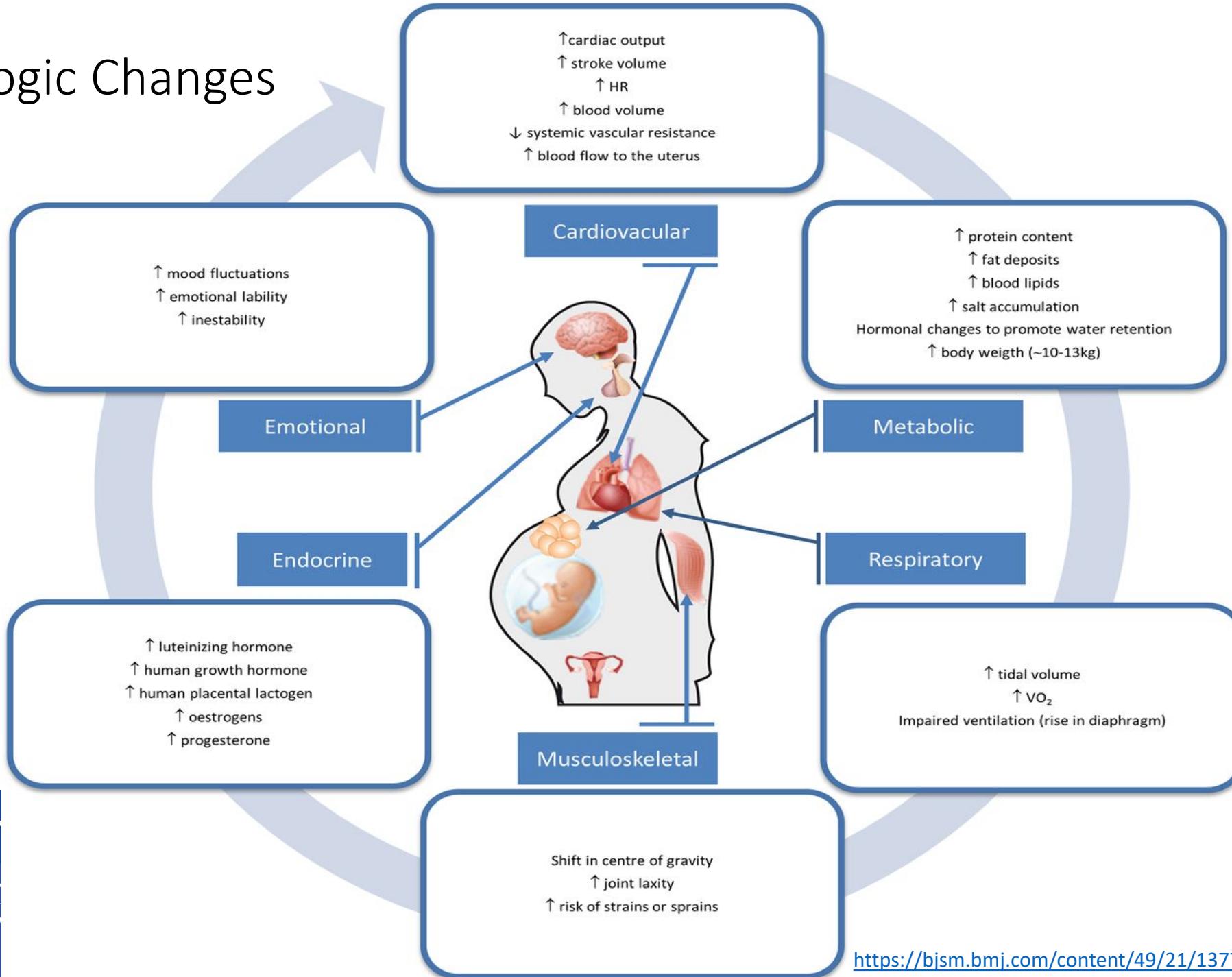


- First trimester → First 12 weeks
  - Fetal development is divided into stages as all of the major organs to include brain, GI system, and limbs form
- Second trimester → 13 to 28 weeks
  - Woman puts on weight, visible uterus, and visible breast changes
  - Ureteral expansion: Can expand up to 20 times its normal size overall during pregnancy
  - Quickenning occurs
- Third trimester → 29-40 weeks
  - The most weight gain during pregnancy for most individuals as the fetus grows rapidly during this stage
    - Fetus gains of 28g per day

- Women's navel may become convex ("pop")
- Woman's abdomen drops due to fetus turning downward in preparation for birth
  - Pelvic tilt → shift in gravitational force → progressive lordosis → low back pain
  - Increased urination due to forces pressing on the bladder
- Overall increase in gravitational force/pressure across all joints
- Increase in water retention



# Pathophysiologic Changes





# Exercise in Pregnancy

- Beneficial overall
  - Improves or maintains physical fitness
  - Helps to maintain weight
  - Reduces risk of gestational diabetes
  - Decreases the incidence of cesarean and operative vaginal delivery
  - Decreases post-partum recovery time (limited evidence)
  - Helps to prevent preeclampsia
  - Improves breastfeeding rates
  - Enhances psychologic well-being



<https://www.shape.com/lifestyle/mind-and-body/emily-breeze-workout-shaming-pregnant-women-never-okay>

# Fetal Response to Exercise

- Heart rate increase
- With vigorous exercise during the third trimester
  - Infants were more likely to weigh 200-400g less than compared to women who did not participate in vigorous activity (intense running programs, high intensity interval training, weight training)
  - No increase in fetal growth restriction
- Overall fetus tolerates 30 minute intervals of strenuous exercise in active and inactive pregnant women

# ACOG Committee Opinion

- Physical activity within pregnancy has minimal risks and has been shown to benefit most women, although some modification to exercise routines may be necessary because of normal anatomic and physiologic changes and fetal requirements
- A thorough clinical evaluation should be conducted before recommending an exercise program to ensure that a patient does not have a medical reason to avoid exercise

- Women with uncomplicated pregnancies should be encouraged to be aerobically active and participate in strength and conditioning training before, during, and after pregnancy
- Overall, regular physical activity improves fitness, helps with weight management, and reduced the risk of gestational diabetes in obese women



<https://theundefeated.com/features/natasha-hastings-runs-down-the-obstacles-of-being-a-pregnant-olympic-hopeful/>

# Recommending an Exercise Program

- Motivational Counseling
  - Increased medical supervision allows for behavior modification and overall motivation to live a healthier lifestyle for the development of the fetus
  - Five A's
    - Ask, Advise, Assess, Assist, and Arrange → aids in developing the exercise plan
- Prescription of Individualized plan
  - Thorough clinical evaluation and assessment of individual health status
  - Program development goal → moderate intensity exercise regimen for at least 20-30 minutes per day on most or all days of the week

## **Box 1. Absolute Contraindications to Aerobic Exercise During Pregnancy**

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



## **Box 2. Relative Contraindications to Aerobic Exercise During Pregnancy** ↵

- Anemia
- Unevaluated maternal cardiac arrhythmia
- Chronic bronchitis
- Poorly controlled type 1 diabetes
- Extreme morbid obesity
- Extreme underweight (BMI less than 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

- Assess for safe and unsafe exercise regimens occurring before the pregnancy to instruct a patient to avoid those activities that may jeopardize the health of the fetus



<https://sites.psu.edu/siowfa16/2016/12/02/female-athletes-may-have-a-harder-time-getting-pregnant/>

### Box 3. Examples of Safe and Unsafe Physical Activities During Pregnancy\* ↵

The following activities are safe to initiate or continue\*:

- Walking
- Swimming
- Stationary cycling
- Low-impact aerobics
- Yoga, modified<sup>†</sup>
- Pilates, modified
- Running or jogging<sup>‡</sup>
- Racquet sports<sup>‡§</sup>
- Strength training<sup>‡</sup>

The following activities should be avoided:

- Contact sports (eg, ice hockey, boxing, soccer, and basketball)
- Activities with a high risk of falling (eg, downhill snow skiing, water skiing, surfing, off-road cycling, gymnastics, and horseback riding)
- Scuba diving
- Sky diving
- “Hot yoga” or “hot Pilates”

\*In women with uncomplicated pregnancies in consultation with an obstetric care provider.

<sup>†</sup>Yoga positions that result in decreased venous return and hypotension should be avoided as much as possible.

<sup>‡</sup>In consultation with an obstetric care provider, running or jogging, racquet sports, and strength training may be safe for pregnant women who participated in these activities regularly before pregnancy.

<sup>§</sup>Racquet sports wherein a pregnant woman’s changing balance may affect rapid movements and increase the risk of falling should be avoided as much as possible.

Committee Opinion, ACOG 650





# Assessment of Activity

- Normal heart rate response to physical activity may be blunted
  - Perceived exertion is preferred
  - Talk Test



<https://www.verywellfamily.com/does-exercise-cause-miscarriages-and-pregnancy-loss-2371373>

**Table 1.** The 15-Grade Scale for Ratings of Perceived Exertion ↵

6	
7	Very, very light
8	
9	Very light
10	
11	Fairly light
12	
13	Somewhat hard
14	
15	Hard
16	
17	Very hard
18	
19	Very, very hard
20	

Committee Opinion, ACOG 650

Reprinted from Borg GA. Psychophysical bases of perceived exertion. Med Sci Sports Exerc 1982;14:377–81.

## **Box 4. Warning Signs to Discontinue Exercise While Pregnant** ↵

- Vaginal bleeding
- Regular painful contractions
- Amniotic fluid leakage
- Dyspnea before exertion
- Dizziness
- Headache
- Chest pain
- Muscle weakness affecting balance
- Calf pain or swelling



# Nutritional Guidelines

- For uncomplicated pregnancies, women should include a variety of food both within and among the food groups to assure that all essentials nutrients are obtained
  - Small meals and snacks at regular intervals
  - Attempt not to skip meals or wait too long to eat
  - High carb snacks before and after exercise

<https://www.twenty20.com/photos/ebf9daec-6c14-48cd-b89c-1ed9e8c9212b>



# Nutritional Guidelines

- Make fats count – essential fatty acids for fetal brain development and eyesight
  - Canola, soybean oils, non-hydrogenated oil, salmon, rainbow trout
- Supplements – Daily folic acid (400mg)
- Fluids – LOTS OF FLUIDS
  - 2 Liters (8 cups) daily from combination of water, milk, juice, decaffeinated beverage, soups
  - Sports drinks – chose 6-8% carbohydrate drinks ie Gatorade or Powerade for refueling of muscles and to replace fluid and electrolytes lost in sweat.

- Limit caffeine
- Avoid alcohol
- Get enough salt
  - If sweating a lot during exercise, you need to replace SENSIBLY with use of table salt, condiments, tomato, or vegetable juice/soup
- Energy bar consumption
  - More carbohydrates than protein is key
  - These ARE NOT to be considered meal replacement
- Be safe! AVOID raw items: meats, seafood, eggs. Avoid unpasteurized soft cheeses, hot dogs wieners, pates

# NCAA Guidelines

- Sample of 92 female college students
  - 62% reported sexually active status
  - 10% report viable pregnancy
  - 15% male and female student 18-24yo report experiencing pregnancy
  - 48% thought they might be pregnant
- Female college athletes
  - Lower reported incidence – 1% of female athletes report pregnancy as athletics decreases sexual activity overall and increases the usage of contraception

# Gender Neutral Pregnancy and Parenting

- No pregnancy discrimination
  - Male and female athletes are protected – team membership, playing time, health benefits, and scholarships are not in jeopardy
- Physical Health importance
  - Professional healthcare monitoring and plentiful hydration to prevent overheating before 14 weeks gestation
  - Should see their physician on the same schedule as a non-athlete
    - Every 4 weeks until 28 weeks
    - Every 2 weeks until 36 weeks
    - Weekly until delivery

- High level of activity under the guidance of the healthcare provider, athletic trainer and coach using a sensible and monitored training method is typically okay before 14 weeks
- Beyond 14 weeks the normal physiologic changes of pregnancy affect the training process and overall performance, thus specific precautions and avoidance is imperative to avoid complications
  - Balance and coordination
  - Supine training affected (laying flat)
  - Valsalva straining in training program
  - Avoidance of training and events that increase risk of abdominal injury



- Emotional support is important for both male and female
  - Parents, Professors, Coaches, Trainers should embrace an Ethic of Caring
- Maintenance of confidentiality is possible and strongly advised
  - Disclosure is discouraged
  - Privacy is key

# Summary

- Athletic activity in a healthy, uncomplicated pregnancy is safe and allows for overall health maintenance
- For those patients with a complicated history, a specific program will be discussed with their team of doctors to determine what is best
- Moderate activity is okay, and activities are adjusted based upon the development of the fetus and changes to a woman's body
- Pregnant athletes should maintain a healthy diet for their activity
- The NCAA recognizes and supports the pregnant athlete, and the care is the same as for the non student athlete

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# References

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Thank you!