EXERCISE & THE MANAGEMENT OF DIABETES DURING PREGNANCY

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This webinar is considered a resource, but does not define the standard of care in California. Attendees are advised to adapt the guidelines and resources based on their local facility’s level of care and patient populations served and are also advised to not rely solely on the guidelines presented here.
OBJECTIVE

• Participants will be able to:
  • Discuss maternal and fetal benefits of exercise during pregnancy (including benefits for gestational diabetes)
  • Explain contraindications to exercise during pregnancy
  • Provide accurate exercise education to patients
OVERVIEW

• Exercise guidelines during pregnancy
• Prenatal exercise myths
• Benefits of prenatal exercise
• Precautions before beginning exercise
• Exercise precautions for diabetes
• Adjusting exercises for pregnancy
• Contraindications to exercise
• Monitoring exercise intensity
• Safe exercises and unsafe exercises/activities
“Pregnant women should engage in 30 minutes or more of moderate exercise on most if not all days of the week.”

- American Congress of Obstetricians and Gynecologists (ACOG), 2009
EXERCISE DURING PREGNANCY

• All women without contraindications should be encouraged to participate in aerobic and strength conditioning exercises during their pregnancy.
  • ACOG, 2009

• Pregnancy is a unique time for positive behavior change
DESPITE THIS RECOMMENDATION

- 50% of OBGYNs do not routinely discuss exercise with pregnant patients
- 68% of OBGYNs do not regularly advise sedentary pregnant women to initiate an exercise program
- Pregnant women tend to reduce the duration and intensity of exercise over the course of their pregnancy
  - Paediatric and Perinatal Epidemiology, 2004
ROLE OF PROVIDER

- Explain benefits of exercise for mother & child
- Provide ACCURATE information
- Review impact on blood sugar (if diabetic)
- Set expectations for patient
- Encourage record keeping
- Reassess goals regularly
MYTHS ABOUT EXERCISE

• It’s dangerous for baby!
  • TRUTH: no fetal risks with mild to moderate activity; more positive birth outcomes compared to inactive pregnant women
    • Diabetes Research and Clinical Practice, 2004

• Walking is the only safe exercise
  • TRUTH: “In general, participation in a wide range of recreational activities appears to be safe.”
    • ACOG, 2009
Myths about exercise, Cont’d

• Maternal exercise dangerously changes fetal heart rate
  • TRUTH: fetal heart rate increases during maternal exercise and drops back to baseline rates after exercise cessation
    • J Appl Physio, 1994

• TRUTH: Regular maternal exercise results in increased fetal heart rate variability, suggesting improved development of fetal autonomic nervous system (compared fetus of inactive women)
  • Early Hum Dev, 2010
Myths about exercise, Cont’d

• Maternal exercise reduces blood flow to fetus
  • TRUTH: While uterine blood flow decreases slightly with increased maternal heart rate, oxygen delivery remains unchanged (due to compensation with increased hematocrit and uterine oxygen extraction)
  • Advances in Fetal and Neonatal Physiology, 2014
GET MOVING!

• “In the absence of contraindications, pregnant women should be encouraged to engage in regular, moderate intensity physical activity to continue to derive the same associated health benefits during their pregnancies as they did prior to pregnancy.”
  • ACOG, 2009
METABOLIC BENEFITS

- Reduces risk of gestational diabetes 49-78%
  - In mothers who regularly exercised during the year prior to conception through 20 weeks gestation

- Reduces risk of excessive gestational weight gain
  - Diabetes Research and Clinical Practice, 2004
METABOLIC BENEFITS

- Improves overall glucose control
  - Fasting
  - Post-meal

- Increases insulin sensitivity
  - Increases muscle insulin sensitivity
  - Reduces need for exogenous insulin in women with gestational diabetes

- *Diabetes Research and Clinical Practice, 2004*
- *American Journal of Obstetrics and Gynecology, 1989*
MATERNAL BENEFITS

- Reduces blood pressure
- Improves cardiovascular function
- May reduce or prevent lower limb edema
- Active women have lower rates of operative delivery
  - Sports Medicine, 2010
MATERNAL BENEFITS

• ↑ Ability to meet the musculoskeletal demands of pregnancy including:
  • Increased girth
  • Increased lordosis
  • Altered center of gravity

• Strengthens pelvic floor muscles
  • Physical fitness may impact pushing during labor (but does not shorten labor)

  • Strength & Conditioning Journal, 2006
MATERNAL BENEFITS

- **Mental Health**
  - Exercise in pregnancy is associated with lower stress, anxiety & depression

- **Confidence/Coping**
  - Improved self image
  - Better able to cope with bodily changes of pregnancy

- **Sleep**
  - Regular exercise improves sleep quality
    - Journal of Physical Activity & Health, 2014
FETAL/CHILDHOOD BENEFITS

- Exercise helps prevent excess maternal weight gain & regulates blood sugar, which reduces the risk of:
  - Macrosomia & childhood overweight
  - Childhood type 2 diabetes
  - Childhood metabolic syndrome
  - Lifetime risk of cardiovascular disease & cancer

- Increases circulation + nutrient flow to fetus

- International Journal of Obesity, 2008
- Nature Reviews Neuroscience, 2008
- Exercise & Sport Sciences Reviews, 2015
FETAL/CHILDHOOD BENEFITS

• Children of mothers who exercised during pregnancy have improved stress tolerance & “neurobehavioural maturation” in childhood
  
  • Sports Medicine, 2010
EXERCISE PRECAUTIONS: BEFORE STARTING

• Get doctor’s approval to rule out contraindications

• Assess current level of physical activity

• Learn to modify exercises for pregnancy

• Learn “Talk Test” to gauge level of exertion

• Know signs and symptoms to stop exercise
EXERCISE PRECAUTIONS: DIABETES

• If taking insulin or glyburide (and therefore prone to hypoglycemia), check blood sugar before and after exercising
  • Know signs & symptoms of hypoglycemia
  • Exercise after a meal/snack
  • Carry blood sugar supplies if extended activity is planned

• Safety precautions
  • Carry carb-containing snack
  • Exercise with a partner
  • Wear appropriate footwear
ADJUSTING FOR PREGNANCY

- Center of gravity shifts forward in late pregnancy, causing lumbar lordosis

- Breasts enlarge and can lead to rounding of shoulders and increased hunching of upper back

- In late pregnancy, lung capacity may be physically limited by baby + uterus

- TIPS: maintain good posture, stretch chest muscles, exercise at comfortable pace to avoid shortness of breath
EXERCISE SHOULD FEEL GOOD!

PROPER ALIGNMENT

BAD POSTURE  GOOD POSTURE

Image from Real Food for Gestational Diabetes
JOINT LAXITY

• Due to surge in the hormone: relaxin

• Makes activities like jumping or twists & turns with sudden starts and stops more likely to cause injury

• Back or hip pain and potential balance problems can occur (especially if abdominals are weak)

• Extra weight significantly increases the forces on the knees and hips during high-impact activities, like running
COPING WITH JOINT LAXITY

- Avoid stretching outside of a joint’s normal range of motion (know your limits, caution with yoga)

- Practice stabilizing and balance exercises

- Perform safe abdominal-strengthening exercises (such as Pilates)
  - Engage transversus abdominus to prevent diastasis recti

- Strengthen pelvic floor to stabilize sacroiliac joint
  - Most women perform “kegels” wrong. Should feel like lifting “lady parts” NOT bearing down
ADJUSTMENTS FOR LATE PREGNANCY

• During 2\textsuperscript{nd} and 3\textsuperscript{rd} trimester, avoid extended periods of time laying on back
  • Weight of baby can put pressure on vena cava, impeding blood flow

• Avoid exercising in hot weather
  • Overheating and dehydration more common in pregnancy
  • Always bring water, take breaks when needed

• Wear comfortable & supportive clothing/gear
  • Good shoes and sports bra improve posture, reduce strain

• Ideally, exercise with a partner
ABSOLUTE CONTRAINDICATIONS

- 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

- ACOG, 2009
RELATIVE CONTRAINDICATIONS

- Severe anemia
- Unevaluated maternal cardiac arrhythmia
- Chronic bronchitis
- Poorly controlled type 1 diabetes
- Extreme morbid obesity
- Extreme underweight (BMI <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

ACOG, 2009
WARNING SIGNS TO STOP EXERCISE

- Advise patients to discontinue exercise in the event of:
  - Vaginal bleeding or amniotic fluid leakage
  - Shortness of breath prior to exertion
  - Dizziness, headache, chest pain
  - Muscle weakness
  - Calf pain or swelling (need to rule out thrombophlebitis)
  - Preterm labor
  - Decreased fetal movement

- If symptoms continue after exercise cessation, seek medical attention
  - ACOG, 2009

CONSULT YOUR DOCTOR
INTENSITY

• There is NO recommended “safe” or “maximum” heart rate during pregnancy
  • “62% of surveyed obstetricians recommend pregnant patients not exceed a maximum heart rate during exercise, even though ACOG guidelines do not specify a maximum heart rate.”

• So how do you measure exercise intensity?
HOW TO MEASURE INTENSITY

• Talk Test
  • Best way to assess intensity of exercise in pregnancy
    • Journal of Perinatal Education, 2000
  • Close correlation between the Talk Test, VO2, ventilatory threshold, and heart rate
    • Medicine Science Sports & Exercise, 2004

• Goal
  • Maintain an intensity of exercise at which light conversation is comfortable
• Periodically during exercise, engage in conversation
  • OR recite a nursery rhyme or ABCs

• If you can “talk the talk while walking the walk” (with a little challenge or difficulty), you are exercising at an appropriate intensity
  • Continue at that intensity

• If you have difficulty catching your breath or are unable to talk, you are likely exceeding safe exercise intensity
  • Simply slow down, catch your breath, resume activity at more moderate pace
SAFE AEROBIC EXERCISE

- Walking
- Swimming
- Stationary bike
- Elliptical
- Step aerobics
- Moderate hiking
- Running/jogging
- Dancing
- Climbing stairs
SAFE STRENGTH EXERCISE

- Lifting weights
- Resistance bands
- Stability balls
- Prenatal Pilates
- Prenatal yoga – (review risk of overstretched)

- Good body mechanics/form prevents injury

- Aim for 2-3x/week
CONTRAINDICATED EXERCISE

**Risks abdominal trauma:**
- Soccer, baseball, etc.

**Risks falls:**
- Gymnastics
- Downhill skiing

**Excessive bouncing/jerking:**
- Horseback riding
- Mountain biking

- ACOG, 2009
EXERCISE RESOURCES

ACOG website:
• For providers: “Exercise During Pregnancy and the Postpartum Period”

• For patients:* Downloadable pdf file “Exercise During Pregnancy”

• [www.acog.org](http://www.acog.org)

*Consult ACOG re: permission to reproduce or distribute materials
EXERCISE EDUCATION

- Ideally, pregnant women should engage in 30 minutes of exercise/day (or 150min/week) in the absence of medical or obstetric complications
- Include Aerobic and Strength exercise
- With a few modifications, many different forms of exercise/activities are safe during pregnancy
SUMMARY

• Exercise is safe and efficacious for the majority of pregnant women

• Contraindications should be ruled out before beginning an exercise program

• Exercise offers a multitude of benefits to mother & baby, including improved glycemic control