

Great Expectations: Prenatal Core Conditioning

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Current ACOG Guidelines

- http://www.acog.org/publications/patient_education/bp
- Apparently healthy women may continue their normal exercise routines.
- Modify as necessary as pregnancy advances.
- HR restrictions dropped in 2002.

Important Benefits of Prenatal Fitness

- Maintain/or build strength: key to staying lean, prevents obesity
 - Builds adequate strength for lifting and carrying the baby and heavy baby-equipment.
- Fewer pregnancy complications
- Aids in labor and delivery
 - Easier adaptation to the lower-intensity endurance activity of early labor. Increased stamina for labor and delivery, with less perceived exertion during labor.
 - Shorter first and second stages of labor.
 - Enhanced pain tolerance.
 - Lower incidences of intervention during labor.
 - Substantially fewer caesarian births.
 - Good pelvic muscle tone—resulting in fewer episiotomies/tearing.
- Improved posture/Decrease in pregnancy discomforts
- Increased energy levels, moods, concentration,
- Stress/anxiety reduction, better quality of sleep, possible reduction in depression (Pre and post natal).
- Improves body image, confidence, self-awareness

Benefits, cont.

- Aerobic exercise before 20 weeks increases the size and cardiovascular capacity of the placenta.
 - Leaner babies, may prevent obesity
 - May increase size of baby's cerebral cortex
 - May increase cardiovascular capacity of baby
 - Strengthens maternal immune system, prenatal and postpartum benefits
- Quicker postpartum recovery, increased likelihood of postpartum exercise
- Decrease incidence of falls

Possible Risk Factor:

- Danish study of 90,000 women found that high-impact exercise is associated with an increased risk of miscarriage in early pregnancy.
 - Associated risks with high volume/intensity/high impact aerobic exercise.
 - More than 7 hours per week.
 - Published in the British Journal of Obstetrics and Gynaecology

Contraindications for Prenatal Exercise

- Cardiovascular disease
- Multiple gestation
- Diabetes
- High blood-pressure
- Pre-eclampsia in a previous pregnancy
- Bleeding in the second or third trimester
- Premature rupture of the membranes
- Pre-term labor, or history of pre-term labor
- Placenta previa
- Incompetent cervix and/or cerclage

Contraindicated Exercises

- Heavy Weight Lifting, especially in first trimester
- Competitive and/or High Impact Sports
- Scuba Diving
- Diving
- River rafting
- Horseback Riding
- Snow skiing and snow boarding
- Water skiing
- Skydiving and bungee jumping
- Ice-skating and ice hockey
- Gymnastics
- Rock climbing
- Road biking and mountain biking

Discontinue Exercise, Advise Md. Consult

- Vaginal bleeding
- Leakage of amniotic fluid
- Dizziness or fainting
- Swelling of the ankles, calves, hands, or face
- Abdominal pain
- Severe headache
- Vision problems
- Fever
- Significant fatigue or muscle weakness
- Elevated heart rate or blood pressure that doesn't return to normal within 30 minutes after completion of an exercise session.

Prenatal Physiological Adaptations

– The Cardiovascular System

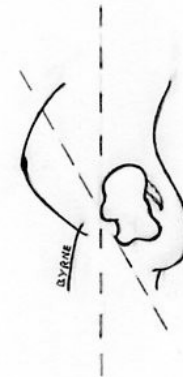
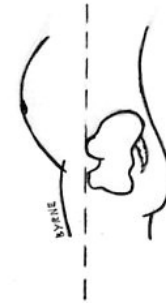
- During pregnancy, the woman's cardiovascular system expands to support the needs of the growing fetus. These changes include:
 - Boosts blood volume by 40% to 50%.
 - Raises resting heart rate by about 15 to 20 beats per minute (BPM) by the third trimester.
 - Elevates cardiac output, or amount of blood pumped per minute.
 - Increases stroke volume,—the amount of oxygenated blood pumped in one heartbeat.
 - Expands tidal volume, or the amount of air you take in per breath.
 - Dilates and relaxes blood vessels (vasodilation), thereby decreasing resting blood pressure, and aiding in circulation.
 - Increase in rate of perceived exertion.
 - Decrease in HR reserve
- Placenta growth finished by 20 weeks: important implications for aerobic programming
- ACOG recommends the minimum activity level of 30 minutes of walking on most days of the week for all healthy pregnant women, including those who have been sedentary. In general, fit women may maintain or even increase their cardiovascular capacity during the first half of pregnancy.
- During pregnancy the cool-down phase of aerobic conditioning sessions must be significantly lengthened to prevent pooling of blood in the lower extremities, dizziness, or fainting. These effects can occur because pregnancy hormones relax blood vessels, resulting in lower blood pressure and increased blood flow to the extremities.

Metabolic Changes

- Boosts basal metabolism.
 1. Elevates daily caloric needs by 300 calories by second trimester.
- Raises core temperature slightly. Heat regulation risk: fact or fiction?
- Slightly elevates insulin levels.
- Increased protein and fluid requirements

Alterations in the Body's Dynamic Support Systems

- Postural Deviations
 - Neutral Pelvic Alignment
 - Anterior Pelvic Tilt
 - Note increased lordosis



Prenatal Muscular Imbalances

Specific Muscle Groups that Tighten

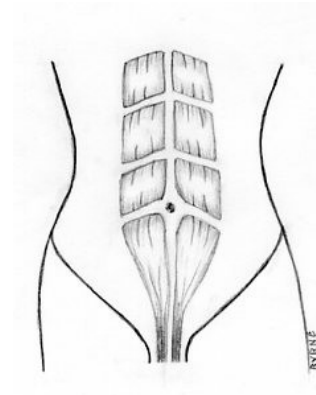
- 1. Hip flexors
- 2. Lower Back
- 3. Upper Traps
- 4. Chest
- 5. Back of the Neck
- 6. Thighs

Specific Muscle Groups that Weaken

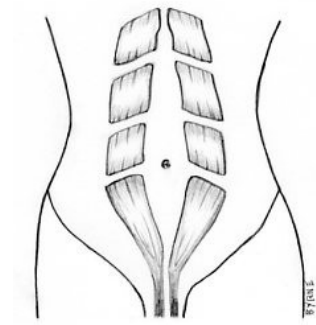
- 1. Abdominal Wall, diastasis
 - 2. Pelvic floor, 3rd trimester
 - 3. Upper Back
 - 4. External Rotators, Serratus Anterior
 - 5. Glutes
 - 6. Hamstrings
 - 7. Front of the neck
- Balance exercises should be an integral part of all Prenatal Fitness Programming

Diastasis Recti/ Abdominal Separation

- Rectus Adomininis



- Abdominal Separation



Abdominal Separation, cont.

- Proper Testing

- External Splinting, uses and problems
- Internal Support through contraction of the TvA
- Contraindicated exercises
 - 1. Movements where the upper body twists and the arm on that side reaches backward, such as during a tennis serve.
 - 2. Exercises that require lying backward over a large exercise ball.
 - 3. Yoga postures that stretch the abs, such as “cow pose,” “up-dog,” all backbends, and “belly breathing.”
 - 4. Most traditional abdominal exercises that work the exterior abdominal muscles, such as crunches and oblique curls.
 - 5. Any exercise that causes the abdominal wall to bulge out upon exertion.
 - 6. Rising from a supine position by rolling up and twisting at the same time. “Log Roll” instead, roll first onto your side, and then use your arms to help push yourself up to a sitting position.
 - 7. Lifting and carrying very heavy objects.
 - 8. Intense coughing without external support of the abdomen. Compress abdomen with large, soft pillow.

Supine Hypotensive Disorder/ Positional Low Blood Pressure

- Supine Exercise restrictions: ACOG avoid supine exercise after 1 trimester.
- Compression of the Vena Cava: Fact or Fiction?
- Current research: BJOG: An International Journal of Obstetrics & Gynaecology
Volume 113 Page 1239 - November 2006, Volume 113 Issue 11
- Implications for fitness professionals

Ligament Laxity

- Elastin peaks at 20 weeks and 2nd surge during labor
- Joint problems: Common sites
 - Ankle
 - Knees
 - Sacroiliac
 - Pubis
 - Coccyx
 - Uterine ligaments: low back pain, abdominal pain, hip hiker
 - Wrist

Carpal Tunnel /Repetitive Stress Syndrome

- Increased Risk During Pregnancy
 - Swelling, fluid retention, and increased blood-volume can restrict and compress the median nerve as it passes through the wrist—the carpal tunnel—and into the hand, causing pain in the hand, wrist and arm.
 - Repetitive stress injuries and Carpal Tunnel Syndrome are increasingly common, and because they have the potential to cause long-term disability, must not be ignored.
- Carpal Tunnel Symptom Checklist
 - Pain in your hand.
 - Pain in your wrist, sometimes extending into the forearm.
 - Weakness in the hand.
 - Numbness and tingling in the fingers, wrist and hand, especially after several hours of use or at night.
 - Advise referral to Physical Therapist who specializes in repetitive motion injuries and the diagnosis and treatment of this condition. Sometimes subtle problems may compound and overlap. Pathology or injury may originate in the neck, shoulder, elbow or wrist.
- Carpal Tunnel Tests
 - Inverted Prayer
 - Tapping on site

Prenatal Exercise Programming

- Well rounded programming includes aerobic exercise, strength training, flexibility training and balance training.
- Include TvA isolations daily, and Kegel exercises after 20 weeks.
- Stretch key muscle groups before strength training.
- While always essential, maintaining good form is never more crucial than during pregnancy. Pay particular attention to spine stabilization when moving the arms above shoulder height.

Training Guidelines for Prenatal Core Conditioning

- **Strength Training:**
 - Select exercises that require support and stabilization of the spine in the neutral position.
 - These types of exercises train the torso and limbs to work synergistically and integrate functional core strength and control together with strong, powerful limbs.
 - Far superior to other exercise modalities that rely on external support to stabilize the spine.
 - When performing core exercises, always remember to engage the TvA (i.e. cue “tighten your internal girdle”) at the start of each exercise, and then maintain the compression of the abdominal wall throughout the entire sequence.
 - Quadruped positions and others that flex the wrist while weight bearing should be done with caution or modified to prevent Carpal Tunnel Syndrome.
 - Watch mechanics of lifting and putting down the weights!
 - Avoid standing for long periods due to pooling of the blood in the extremities.
 - Keep head in line with, or above the shoulders.

Strength Training, cont.

•Selected Exercises:

1. Free weights/band/tubing for upper body where the spine is stabilized in the neutral position.
2. Variations: Standing, physioball, seated on chair or bench
3. Multi-adjustable Cables easily adapted.
4. One plane of action easier to control.
5. Selected Exercises:
 - Flies: front, side, side lying on bench
 - Lat Pulls
 - Military Press, Overhead Press: lifting in daily life
 - Upright Row: lifting in daily life
 - Seated Rows, bench or ball
 - Tricep Kickbacks
 - Biceps curl, hammer curl
 - Standing calf raises
 - Inclined seated Chest Press
 - Assisted Pull-up
 - Lunges and squats, OK: watch for TvA control and knee alignment
 - Quadruped exercises OK: watch for TvA control
 - Abdominal Exercises: TvA isolations: standing, seated on ball, bench or chair, side lying. Pelvic tilts, isometric squeezes, bridging. Avoid upper body flexion when working the abs, focus on lower spine flexion.
 - Side lying exercises for glutes and legs, OK: use “outrigger” position in upper arm to aid stabilization and train rotator cuff.
 - Thoracic extension exercises for advanced students.

Flexibility Training and Yoga:

- Always stretch muscle, never joints
- Engage oppositional muscle
- Avoid stretching the sacroiliac joint—especially in positions where the hip is flexed and the thigh is externally rotated—or perform with caution, if at all.

Yoga Modifications and Precautions:

- All lotus and pre-lotus positions sickle the foot and torque (stretch and twist at the same time) ligaments of the ankle joint—not a good idea in general, but especially dangerous during pregnancy/postpartum, and for those with a history of ankle sprain.
- Yoga poses that stress the lateral (side) ligaments of the knee, especially if the hip socket is not sufficiently flexible, such as pigeon-pose.
- Triangle pose, and straddle type stretches with spine twist: may cause or worsen sacroiliac instability.
- Poses that compress the lower back, and/or stretch the abdomen, such as up-dog, back bends, and cow-pose (when performed with slack abdominals.)
- Seated poses where the spine is twisted and flexed at the same time.
- Standing poses, always cue anterior lift of the pelvis and TvA control.
- During pregnancy, extensive use of belly-breathing, where the abdominal wall is overly expanded during inhalation may cause or worsen abdominal separation. Substitute centered-breathing, where the ribcage expands three dimensionally during inhalation.
- Never release the compression of the abdominal wall during quadruped exercises.
- Bikram or other “hot” yoga styles are not recommended during pregnancy.
- Inverted poses may be OK for advanced practitioners in 1st half of pregnancy. However, may increase likelihood of dizziness/fainting when coming out of the pose.

Pilates Modifications:

- Most mat and floor exercises contraindicated.
- Spine supporter apparatus: not functional.
- Relaxing back onto a Bosu: not functional.
- Most seated exercises, on either mat or reformer OK, transfer to physioball when belly gets in the way.
- Physioball: seated, bridging, free weights or bands, plank for advanced students.
- Standing variations for leg extensions, front and side.
- Use bench or chair for posterior leg extensions.
- Quadruped and modified quadruped exercise OK.
- Spine Mobilization: Flex/extend the spine in one plane only.

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