

## **Vol 2, 2002 CEC ARTICLE**

### **PRE/POST NATAL EXERCISE**

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The new ACOG guidelines (1994) recommend the ELIMINATION OF HEART RATES and utilizing the perceived exertion scale as the criterion measure of intensity. In the original guidelines, maternal heart rate was limited to 140 bpm. These were based upon the fear that increases in maternal heart rate and core temperature during exercise could harm the fetus in the form of intrauterine growth retardation, premature delivery and various forms of fetal distress.

ACOG recommends that women who currently participate in regular exercise program can continue their training during pregnancy. Studies have demonstrated that women naturally decrease their exercise duration and intensity as their pregnancy advances. Those who begin an exercise program AFTER becoming pregnant are advised by the college to receive physician authorization and begin exercising with low-intensity, non-impact activities, such as walking, swimming, and water aerobics.

The new guidelines differentiate between women who are currently exercising and become pregnant, and women who begin an exercise program after they become pregnant.

### **MECHANICAL CHANGES**

#### **BREATHING**

Exercising can increase your aerobic capacity during pregnancy; if you don't exercise it will likely decrease. The diaphragm is restricted due to the expanding uterus, making it difficult to draw the diaphragm down far enough when you inhale. The rib cage flares out to allow adequate room for the lungs. Oxygen consumption increases by 15% to 20% during pregnancy, however, the oxygen that's stored in your blood and muscles (oxygen reserve) decreases.

#### **HEART AND CIRCULATORY**

During pregnancy, the resting heart rate may increase by up to 20%; blood volume increases by 30% to 50% and cardiac output increases by 40% to 50%. This is to meet the needs of the growing uterus and baby. The capacity of the heart to meet the body's demands, cardiac reserve, diminishes. This means that you'll get tired sooner.

- THIS MEANS THE HEART RATE AND CARDIAC OUTPUT ARE ELEVATED, EVEN AT REST. THUS, PREGNANT WOMEN REACH THEIR MAXIMUM CARDIAC OUTPUT AT A LOWER LEVEL OF WORK.

#### **STOMACH AND INTESTINAL**

Morning sickness usually occurs during the first 3 months, because of hormonal changes. However, nausea and vomiting are not limited to the morning hours. The nausea is more severe with an empty stomach. Hormonal changes cause activity in the stomach and intestines to slow down. The stomach and intestines are moved upward by the enlarged uterus; this can cause heartburn and indigestion. Constipation is a problem for about half of all pregnant women because of the slowed digestive process.

## KIDNEY AND BLADDER

The growing uterus presses on the bladder, causing the pregnant woman to feel the need to urinate more frequently. Many women tend to leak urine late in their pregnancy. Fluids are often retained late in the pregnancy; swelling of the legs and ankles is common, but swelling in the hands and face may indicate a problem that should be checked out by your caregiver. When not exercising, elevating the legs and wearing support hose can help.

## MUSCULAR, JOINT, AND POSTURAL CHANGES

The center of gravity shifts due to the growing uterus pressing on the pelvic area, and weight gain. The hormone relaxin, estrogen, progesterone & elastin cause relaxation of ligaments and cartilage around joints, and cause the rib cage to expand. Joints become less stable. This leaves you prone to injury in the third trimester.

- For this reason, it is not recommended to work in buoyancy ankle cuffs, especially for new participants.

The hip joints, in particular, become sore. The stomach muscles can become strained as they stretch, and the lower back muscles tighten, and can become sore. Many women experience a mild separation of the abdominal muscles, call diastasis recti. This is not serious, but it will affect your workout. Lordosis (swayback) is common in pregnancy. It can be caused by shifting the center of gravity and the weight of the uterus on the pelvic area. As the pelvis tilts forward, the lumbar curve in the lower back is accentuated. The shoulders often slump forward to counterbalance the curbing of the lower back. Poor posture can cause backaches and muscle spasms.

- Do not flex the joints excessively or stretch to your limit. Joints are looser during pregnancy and more vulnerable toward injury. Particularly hip and knees. Also, with the knees, if pressed back, you can strain joints and push your pelvis forward. Bend the knees to ease body weight over the feet.

## PELVIC FLOOR CHANGES

The pelvic floor muscles act as a sling to support the abdominal and pelvic organs. During birth, the pelvic floor muscles stretch to allow the baby to come out. When these muscles are toned and strong, they aid in having a controlled birth. Because of the weight of the uterus, they sag during pregnancy. Strong pelvic floor muscles also alleviate the common prenatal problem of leaking urine, because these muscles control the bladder.

## EXERCISE IMPLICATIONS

Watch your exercise intensity; don't overexert. Overexertion can contribute to breathlessness and hyperventilation. To avoid hyperventilation, breathe slowly and evenly, inhaling and exhaling deeply.

Don't hold your breath. Many women have a tendency to do so during exertion; this is called the Valsalva maneuver. It can cause dizziness or fainting.

Lift your arms up and out to ease breathing. This relieves the pressure the uterus puts on the diaphragm and allows the rib cage to expand.

If you get stitches, cramps that occur in the rib cage muscles, massage the sore muscles, blow out forcefully, and lift your knees.

Exercise can help ease varicose veins because it increases circulation. The hydrostatic pressure of the water also helps the venous return.

Rise and change directions slowly to avoid dizziness

Drink enough fluids - six to eight glasses per day. Be especially careful to drink enough fluids if you're vomiting.

Doing pelvic floor exercises (Kegels) can help control the bladder muscles and prevent leaking urine. Make directional changes slowly and avoid complicated foot patterns as your center of gravity shifts.

Don't stretch to your maximum, and be careful about making sudden changes in direction as your joints loosen.

Check regularly to see if your abdominal muscles are separating, and modify your abdominal exercises if necessary.

Strengthen your abdominals, your back muscles, and your buttocks to help achieve a healthy posture.

### **ABDOMINAL MUSCLES**

The rectus muscle can separate down the center of the abdomen, a condition called diastasis recti. This condition can be caused by the baby pushing on the uterine wall, hormonal changes, or straining of the muscles. It is not painful, and you can continue to exercise when the stomach muscles separate, but you may need to adjust your abdominal exercise if the separation is greater than an inch.

### **TEST FOR ABDOMINAL SEPARATION**

Lie on your back with your knees bent and your feet flat on the floor. place your fingertips just above or below your navel. Lift your head and shoulders off the floor and pull your chin to your chest. Press firmly on your stomach, feeling for any separation between the bands of vertical muscles. If the separation is greater than two fingers' width, you should be careful not to strain your abdominal muscles as you exercise. Ask your medical caregiver or exercise instructor how you should modify your exercise.

### **SUPINE HYPOTENSIVE SYNDROME**

When the enlarged uterus places pressure on the inferior vena cava (the vein that returns blood to the heart from the torso and legs), nausea, dizziness, breathing difficulties, and

claustrophobic feeling can occur. This condition, called supine hypotensive syndrome, is brought on most often by lying on your back after the first trimester of pregnancy. It is the major reason the American College of Obstetricians and Gynecologists advises pregnant women not to perform exercises while lying on their back after the first trimester.

- 5-10% of women experience the supine hypotensive syndrome. Studies have shown the greatest decrease in cardiac output to result from standing motionless for prolonged periods of time.

Currently, as of June, 1997, the *American College of Obstetricians and Gynecologists* **have not done any studies in regards to the buoyancy effects of the water**, in relation to the participant exercising on her back. Until such research is done, and there are results stating otherwise, it is the position of Aquatic Fitness Professionals Association-International to adhere to the current guidelines for the safety of the participant.

It is hypothesized that due to the buoyancy of the water, and the baby being in a sac of amniotic fluid, that the woman could exercise on her back past the first trimester. In addition, seldom is a true supine position used in the water. Use the ACOG guidelines to inform your participants, and allow them to monitor how they feel. As the baby grows, and becomes heavier, it will begin to apply more pressure on the mother's inferior vena cava.

#### PREGNANCY CAUTIONS

If these symptoms should occur, the person should NOT be exercising.

#### SEEK IMMEDIATE MEDICAL CARE

• Vaginal bleeding	• Abdominal or chest pain
• Leaking/gushing from vagina	• Sudden swelling of hands, feet or face (edemia)
• Severe persistent headache	• Dizziness/lightheadedness
• Noticeable DROP in fetal activity	• Painful, reddened area on legs (circulation problem)
• Severe pubic/hip pain	• Pain/burning with urination
• Irritating vaginal discharge	• Oral temp greater than 100 degrees F (38 degrees C)
• Persistent nausea/vomiting	• Uterine contractions
• Heart palpitations	• Shortness of breath
• Pre-mature labor	• Incompetent cervix

<p><b>BENEFITS OF EXERCISE</b></p> <ul style="list-style-type: none"> <li>• reduced leg cramps</li> <li>• reduced swelling</li> <li>• eased gastrointestinal discomforts, including constipation</li> <li>• eased postpartum recovery</li> <li>• improved circulation</li> <li>• enhanced muscular balance</li> <li>• strengthened abdominal muscles</li> <li>• maintain muscular strength</li> <li>• improve or maintain cardiovascular fitness</li> <li>• improve flexibility</li> <li>• improve posture</li> </ul>	<ul style="list-style-type: none"> <li>• Improved strength, muscle tone &amp; joint stability</li> <li>• Positive body image &amp; self esteem</li> <li>• Increased general well being</li> <li>• Increased endurance (prepare for labor)</li> <li>• Increased aerobic capacity</li> <li>• Controlled weight gain (there is no guarantee that she is going to only gain the Dr. recommended 25-30 lbs.)</li> </ul>
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<p><b>EXERCISE MODIFICATIONS</b></p> <ul style="list-style-type: none"> <li>• Decrease intensity</li> <li>• Regular breathing</li> <li>• Postural awareness</li> <li>• Slower directional changes</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid maximum stretches</li> <li>• Check for abdominal separation regularly</li> <li>• Strengthen back, abdominals and gluteals</li> <li>• Practice relaxation techniques</li> </ul>
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No heart rate recommendations

\*Fit moms can exercise harder

\*Beginners should take it easy

**STAY WITHIN COMFORT ZONES OF EACH PERSON**

- Get Dr. ok before beginning
- Walking, swim, H2Obics recommended for deconditioned
- Exercise can increase aerobic capacity during pregnancy
- Exercise can help digestion
- Exercise can help increase demands on cardiovascular system
- Avoid supine position after the 1<sup>st</sup> trimester (supine hypotensive syndrome)

FYI - in the water, you are not in a true supine position

**Suggested Guidelines for a Pre-Natal Class**

Purpose:

Maintain a fitness level, **not** to "get in shape".

It is to increase stamina and aerobic capacity.

- Post partum can occur up to 1 year after birth.

- Benefits of prenatal exercise: (1) Quicker postpartum recovery (2) women who exercise during pregnancy are usually more anxious to exercise after birth (3) preparation for lifting and carrying newborn.

Moderate aerobics, use RPE

Work on levels 1 (standing upright) and 2 (shoulders submerged)

No propulsions (rebound), no level 3 (buoyant/suspended)

Cue proper body alignment. Important to tone the muscles needed for delivery

Use music (style & BPM) geared toward the physical capabilities of your class.

Unlike traditional classes, stretches & limbering may be performed throughout class: beginning - middle - end.

Special Pre-Natal class is psycho-social. Helps reduce stress, make new friends and share the pregnancy experience.

Good time to have a pre-natal class, late A.M., or early P.M.

Fit individuals have been shown to regulate their body temperature more efficiently than unfit individuals.

For deconditioned participants,  
ACOG recommends not working over 140 B.P.M.

#### RECOMMENDATIONS

1. Increase activity gradually, if inactive prior to pregnancy
  2. Limit vigorous exercise to 15-20 minutes
  3. Drink plenty of water before, during and after class
  4. Have a written waiver (approval) for each participant
  5. Women with certain medical conditions or high risk for complications should avoid exercise
  6. A woman should stop physical activity and contact her doctor if any unusual symptoms appear.
- \* ABSOLUTE: Stay out of hot tubs and saunas

#### NUTRITION

The pregnant exercise needs 300-500 calories *more* per day

Pregnant exerciser uses more carbohydrates vs. fats. Maternal blood glucose levels are significantly reduced after strenuous exercise. especially during the last trimester.

- ❖ Maternal carbohydrate stores are the fetus's primary source for growth and development.

Studies reported lower birth weight babies among women who continued with HEAVY exercise throughout pregnancy.

Other studies have shown no difference in infant birth weights, particularly when the mother receives nutritional counseling.

- ❖ Interesting study:

Women who continued to exercise throughout pregnancy, but DECREASED their activity as they approached term, were found to have **heavier babies** when compared to both sedentary women and those who maintained or increased their exercise levels. Another studies outcome: exercise was positively associated with fetal growth.

CEC ARITICLE TEST QUESTIONS  
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1. In 1994 what did ACOG eliminate and replace with perceived rate of exertion and with what constraint?

2. List 10 of the things that change during pregnancy

3. T or F oxygen consumption increases during pregnancy

4. T or F stored oxygen increases during pregnancy.

5. T or F pregnant women's heart rate is elevated, but cardiac output is decreased.

6. T or F buoyancy cuffs can be used if the flotation belts are uncomfortable.

7. List 5 of the exercise implications for pre/post natal exercise.

8. Describe Supine Hypotensive Syndrome

9. T or F Because the water is supportive it is okay to work in the supine position in the water after the first trimester.

10. What type of exercise does ACOG recommend for pregnant women?

11. List 5 Benefits of Exercise for Pregnant women?

12. List 10 precautions for when not to exercise when pregnant.

13. List 5 Exercise Modifications for Pregnant women?

14. What muscle group should be emphasized in a pre/post natal class?

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