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Physiotherapy in OBSTETRICS



Namrata Kundariya

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CHAPTER 4

Antenatal Physiotherapy

Chapter Outline

- Guidelines for Exercise during Pregnancy in Healthy Women
- Contraindications to Exercise during Pregnancy
- Benefits of Exercise during Pregnancy
- Routine Antenatal Care
- Exercises Prescription
- Antenatal Physiotherapy for First Trimester of Pregnancy
- Antenatal Physiotherapy for Second Trimester of Pregnancy
- Antenatal Physiotherapy for Third Trimester of Pregnancy
- Guidelines for Managing the Pregnant Women
- Sacroiliac Joint Pain/Posterior Pelvis Pain/Pelvic Girdle Pain
- Effects of Supine Lying during Pregnancy

INTRODUCTION

Pregnancy is physiological process and female body and organs can adjust to this process to maintain good maternal and fetal health. Antenatal care is an essential pillar of safe motherhood. Normal delivery is the best thing for mother and fetus as physiological point of view. There are many factors which lead to normal delivery and proper exercise is one of it. Beginning or continuing a moderate intensity exercise is beneficial for pregnant women and fetus.[1,12]

The aim is to give optimal care to the mother so that she can endure the nine months of pregnancy without any complications. Manual techniques, postural education, care of back and SI joint and ADL modification will help to reduce the joint stress in pregnant women. Physiotherapist should help the woman to activate transverse abdominus, multifidus and pelvic floor muscles which eventually helps to maintain the core stability, prevent back pain and SI joint pain and strengthen the core muscles.[2]

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Postural adaptations such as forward shift, anterior pelvic tilt, increase in lumbar lordosis and thoracic kyphosis are common during pregnancy. 75% women shows more posterior posture, weight of the uterus is shifted posterior to the normal center of gravity which is the most common cause for back and pelvic pain during pregnancy.

Research shows that due to secretion of relaxin hormone, pre-pregnancy postural habits exaggerate during pregnancy which can cause back and pelvic pain. After the delivery of baby, woman will return to pre-pregnancy state. Therapist should educate pregnant women about the dangers of contact sports, scuba diving, fall and excessive joint stress which can result in fetal defects or fetal decompression disease.[1]

Travel

There is no specific contraindication to travel during pregnancy. The safest time to travel during pregnancy is between 14 and 28 weeks and she should always wear seat belt. Due to the risk of delivery in unfamiliar atmosphere, it is not safe to travel on airplanes after 34 weeks of gestation.

During any kind of travel, pregnant women should stretch and straighten their legs and ankles periodically to prevent venous stasis and the possibility of thrombosis.

Environment

Environmental condition is important during pregnancy as it affects the temperature regulation and hydration. For the hydration regulation, advice woman to take adequate fluids during and after exercise, avoid heat and humidity and wear loose fitting cloths.[3,6]

GUIDELINES FOR EXERCISE DURING PREGNANCY IN HEALTHY WOMEN[4,9,11,12,14,24]

- Obtain medical clearance before participation.
- The exercise prescription must be on the basis of individual needs and regular mild to moderate exercise is preferable with gradual increase in intensity.
- A maximum heart rate limit up to 155 b/min is recommended. It can be higher than this but only prescribed on an individual basis.
- Some recommended activities are walking, cycling, swimming, low impact aerobics and stretching.
- Exercise in supine position is not recommended after the 4th month due to possible risk of compression syndrome.

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- Advice her not to stand steady for longer duration or perform exercises which can cause loss of balance.
- Drink plenty of fluids before, during and after exercise.
- Guide her to understand the warning signs to stop exercising and take rest when feels fatigued and never reach a point of exhaustion.
- Eat an additional 150–350 calories a day especially complex carbohydrates to replace muscle glycogen stores and to fulfill the additional nutritional demands.
- Must wear loose clothing which allows ventilation.
- Do not exercise in hot and humid climate or when feeling fatigued.
- Bouncy and jerky movements, high altitude activities and scuba diving should be avoided during pregnancy.
- Competitive contact sports are allowed only during the first 16 weeks of healthy pregnancy and only if woman was active in sports before pregnancy otherwise it must be avoided throughout pregnancy.
- Light to moderate weight lifting is encouraged to improve or maintain strength but Valsalva maneuver must be avoided.

CONTRAINDICATIONS TO EXERCISE DURING PREGNANCY (TABLE 4.1)

Table 4.1: Absolute and relative contraindications to exercise during pregnancy[5,6,9,11,14,19,24,26,29]

Absolute contraindications	*Relative contraindications*
Maternal cardiovascular, thyroid respiratory or systemic disease	History of 3 or more miscarriage or premature labor
Poor fetal growth	Maternal type I diabetes
Ruptured membranes–Rupture of amniotic fluid before the onset of labor or premature labor	History of rapid labor or poor fetal growth
Persistent bleeding after first trimester	Early pregnancy bleeding
Incompetent cervix, early dilatation of cervix before the pregnancy is full term.	Extremely sedentary lifestyle with very poor fitness
Preeclampsia: Pregnancy induced hypertension or toxemia	Breech presentation after 28 weeks
Multiple pregnancies (triplets, etc.)	Palpitations or arrhythmias
Placenta previa—placenta is located on the uterus in a position where it may detach before the baby is delivered	Anemia or iron deficiency

Contd...

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Contd...

Absolute contraindications	*Relative contraindications*
Hemodynamically significant heart disease	Extreme over- or underweight
Restrictive lung disease	Chronic bronchitis
Sudden swelling of ankles hands and face	Extreme morbid obesity
Acute infectious disease	Extreme underweight
Risk for preterm labour	Orthopedic limitations
	Poorly controlled seizure disorder
	Heavy smoker

BENEFITS OF EXERCISE DURING PREGNANCY[14]

- It helps to avoid excessive fat accumulation and so maintains healthy body weight.
- Maintain or improve cardiovascular fitness, muscular strength and endurance, and flexibility.
- Helps to decrease or avoid the chances of musculoskeletal problems like back pain, SI pain and other minor discomforts of pregnancy.
- Improve posture and body mechanics, which will improve coordination, balance, and body awareness.
- Causes breathe awareness; enhance self image, reduce stress and gives relaxation.
- Prevent and treat gestational diabetes, hypertension, and preeclampsia.
- Helps to reduce the complications of delivery and promotes good and early postnatal recovery.

ROUTINE ANTENATAL CARE

Aims[8,15]

- To maintain and improve good physical and psychological health throughout the pregnancy.
- To identify and treat pregnancy complications.
- To detect fetal abnormalities as early as possible.
- To educate about pregnancy, labor, puerperium and care of newborn.

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Subsequent Visits[15,29]

Following the first attendance it is most usual for women to be seen at interval of 4 weeks up to 28 weeks gestation, at interval of 2 weeks up to 36 weeks, and after that weekly till delivery. Always check for blood pressure, weight, presence of edema, fundal height and lie of the baby, fetal heart rate and movement.

Warning signs are:

- Leakage of fluid from vagina
- Vaginal bleeding
- Abdominal pain: Distressing in nature
- Headache
- Visual changes
- Decrease or loss of fetal movements
- Fever, rigor, excess vomiting and diarrhea.

Blood Pressure

Blood pressure must be checked at each antenatal visit. In early pregnancy, it is necessary to check baseline blood pressure. Initial recording of blood pressure before 12 weeks helps to differentiate a pre-existing chronic hypertension from a pregnancy induced hypertension developing later on. It slightly decreases during the second trimester due to dilatation of blood vessels. Increase in blood pressure can be the first sign of eclampsia.[10,15,28,29]

Maternal Weight Gain

In normal pregnancy, variable amount of weight gain is constant phenomenon. Initially woman may lose weight because of nausea and vomiting. During subsequent months weight gain is progressive until the last 1 or 2 weeks. This has been distributed to 1 kg in first trimester and 5 kg in second and third trimester.[29]

It is inadvisable to allow pregnancy weight gain to become excessive. It may be due to excess fluid retention and could be first sign of pre-eclampsia. An average of 12.5 kg is advised. If the weight gain is less than normal, stationary or falling it may be due to intrauterine growth restriction (Table 4.2).[15,29]

Ideally weight gain should depend upon pre pregnancy BMI level.[29]

- Weight gain for a woman with normal BMI (20–26) is 11–16 kg.
- An obese woman (BMI > 30) should not gain more than 7 kg.
- Underweight woman (BMI <19) may be allowed to gain up to 18 kg.

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Table 4.2: Total weight gain for single fetus.[19,20]	
Fetus	3.36–3.88 kg
Placenta	0.48–0.72 kg
Amniotic fluid	0.72–0.97 kg
Uterus and breasts	2.42–2.66 kg
Blood and fluid	1.94–3.99 kg
Muscle and fat	0.48–2.91 kg
Total	9.70–14.55 kg

Edema

In the third trimester there is increase in fluid retention which results in edema of hands, ankle and feet in most women. This can reduce joint ROM and cause pressure on nerves and this can result in carpal tunnel syndrome.[12,15]

Fundal Height and the "Lie" of the Baby

Compare the gestational age and symphysio fundal height of uterus. Normal growth is 1 cm per week ± 2 cm. At 32 weeks symphysio-fundal height should be 30–34 cm. Less than 30 cm may indicate intrauterine growth retardation (IUGR) or oligohydramnios. Greater than 34 cm may indicate multiple pregnancy, polyhydramnios or macrosomia. In case of multiple pregnancies, the fundal height gets increased. In second trimester of pregnancy, the fetus will frequently change the position. By the time of 36 weeks, 93% of cases will be in cephalic position.[13,15,28]

Fetal Movements

It is noticed by the mother between 16 and 22 weeks of gestation. Fetus starts moving since 8 weeks but mother cannot feel it because; uterus is not sensitive to touch. It will be felt by the mother only when it contacts with the anterior abdominal wall. In case of subsequent pregnancy, the women will feel movements early. May be because she is already experienced this sensation before and she is aware about the sensation. Fetal movements are used to measure the baby's health. Decrease or stoppage of normal fetal movement may indicate serious complications. "Kick charts" are used to monitor the well being of baby. The mother makes note of first ten movements per day. Record the time and strength of kicking. The longer the time spans for ten movements the greater the concern.[14,15,28]

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Fetal Heart Rate

It is preferable to question mother about fetal movements that she feels, rather than listen to baby's heart rate, this will be good indicator of fetal well being. It cannot be heard before 20 weeks using stethoscope. The normal rate will vary between 120 and 160 beats per minute.[15]

EXERCISE PRESCRIPTION[16,17,24,26]

Therapist must closely monitor the patient and adjust the exercise according to patient's condition.

Frequency: Minimum three times per week and preferably daily.

Intensity: Woman who used to do regular exercise before pregnancy, exercise intensity must not exceed pre-pregnancy levels. Use the talk test to monitor the exercise intensity. HR ranges related with moderate intensity exercise have also been developed for pregnant women based on age.

Time: Moderate intensity exercises minimum 15 min/day and gradually increases to at least 30 min/day (Avg–150 minutes/week).

Mode: Exercises which use large muscle groups should be prescribed. Weight bearing and non-weight bearing exercises both are safe during pregnancy, as long as she is comfortable. Non-weight bearing exercises like swimming and cycling improves physical as well as mental health and weight bearing exercises like walking, jogging and low impact aerobics improves physical fitness.

ANTENATAL PHYSIOTHERAPY FOR FIRST TRIMESTER OF PREGNANCY

In the first trimester strenuous exercise should be avoided as it may lead to miscarriages. Concentrate on improving posture, strengthening of pelvic floor, relaxation and breathing exercises.[17]

Table 4.3: Heart rate range according to age of pregnant women[17,19,20]

Age (Years)	*Heart Rate (beats/minutes)*
<20	140–155
20–29	135–150
30–39	130–145
>40	125–140

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Low Impact Aerobic Exercises

Depression is common among pregnant women and it is associated with increased risk of prenatal and postnatal complications. Exercise is an effective therapy for depression. According to studies, 3 months of aerobic exercise training helps to reduce the severity of symptoms of depression among pregnant women.[18,25]

Walking

It is one of the best exercises for the pregnant women. It is safe and helpful throughout the nine months and can be built into day to day schedule. Shoe with proper fitting and support must be prescribed. Studies prove that, everyday 30 minutes of walk improves birth outcome.[13,19,26]

Swimming

It is the best and safest non-weight bearing exercise which provides cardiovascular workout, helps to stretch and tone the muscles in antigravity environment, and helps to minimize joint damage and balance problems. During first trimester, minimum 20 minutes swim 3 times a week is beneficial.[13,20,26]

Stationary Bicycling

It is excellent aerobic exercise during first trimester of pregnancy and has less risk of fall than standard bicycle. It helps to avoid joint strain and easy for woman who is new to exercise.

Breathing Exercises

Breathing pattern shows mental and physical level of the woman. Breathing is slow and rhythmic when at rest and become erratic and shallow in stressful situation. She may hold her breath in this situation. Breath control will help her to know her state and also help to relax. This will help to reduce the time duration for normal vaginal delivery and also reduce the physical damage during labor. During a contraction, the aim of breathing exercise is that her thought processes are re-directed from a pain response to a learned relaxed breathing response. The woman will develop relaxed response to painful stimuli only through practice.[14-16]

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Deep Breathing Exercise

Deep breathing exercise is the most efficient method of breathing during pregnancy for pregnant woman and fetus. This technique assists the women to relax, improve circulation of blood, boosts the supply of oxygen to mother and fetus both.[17-20]

- Sit comfortably with back supported in a well ventilated setting.
- Close eyes, relax shoulders, facial expression, jaw muscles and release any tension.
- First, ask her to notice natural pattern of breathing.
- Now ask her to inhale deeply and slowly through nose.
- Ask her to fill lungs and imagine breathing deeply into abdomen. During breath in, her abdomen should move forward.
- Ask her to breathe out through mouth. During breath out her abdomen should move downward.

Pelvic Floor Exercises

Pelvic floor muscle exercises must be started in the first trimester of pregnancy as a preventive strategy for urinary incontinence. It helps to prepare for childbirth and prevents uterine prolapse, urinary incontinence and haemorrhoid.[21-23,26,27]

Finding Pelvic Floor Muscles

For finding pelvic floor muscles, ask woman to trying to stop passing gas and flow of urine at the same time. By doing this, woman will feel "squeeze and lift" of pelvic floor muscles. Ask her to continue the contraction for as long as she can (upto 10 seconds) then release and relax for some seconds. Repeat this procedure as many times she can upto maximum of 10 repetitions. It helps to improve the endurance of pelvic floor muscles.[24,25]

Precautions must be taken while doing this exercise. Perform this exercise without:

- Contraction of buttocks
- Breath hold
- Squeezing legs together

Women can do this exercise during normal day to day activities. For example, while cleaning teeth. If a woman is unsure that she is exercising the right muscles, ask her to put thumb into the vagina and perform the exercises. She should feel a gentle squeeze as the pelvic floor muscle contracts. It is very important to learn the exercises properly, and therapist must check that woman is doing these exercises correctly.[26,27]

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- Sit comfortable. Keep feet and knees apart. Lean forward and place elbows on knees. Continue normal breathing and keep all the muscles relaxed, specially muscles of stomach, legs and buttocks.
- Ask her to imagine trying to pass a wind and stop passing urine at the same time. While doing this she must feel squeezing and lifting of pelvic floor muscles.

Posture Awareness

Postural awareness helps to release tension, improves blood supply and function of autonomic nervous system which in turn improves the functioning of reproductive organs, and reduces strain of muscles, joints and ligaments.[28,29]

Standing Posture

- Head and Neck: Head should be relaxed and balanced on the top of the spine with neck straight.
- Shoulders and Arms: The arms hang comfortably by sides freely without any tension. Both shoulders must be at the even height.
- Legs and Feet: The feet should be foot apart with the toes facing forward. Weight should be taken equally on both the feet.

Stretching Exercises

Stretching exercises are implemented with precaution. Because of hormonal changes connective tissues and supporting joint structures are at increased risk of injury from forceful stresses during pregnancy and the immediate postnatal period.[29]

- **Low back stretches (Cat and Camel Exercise)**
  Patient Position: Quadruped Position
  Procedure:
  - In quadruped position, relax the head and allow it to drop.
  - Round the back up towards the ceiling until the stretch is felt in the back.
  - Hold the stretch position till it feels comfortable or around 15 to 30 seconds.
  - Then return to the starting position with flat back.
  - Now sway the back by pressing abdomen toward the floor and lift buttocks toward the ceiling.
  - Hold this position for 15 to 30 seconds or till it feels comfortable.
  - Repeat 2 to 4 times.

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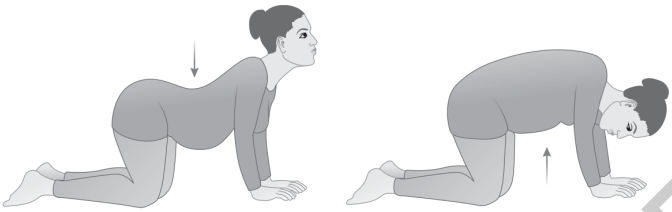

Figure 4.1: Low back stretches.

- **Backward stretch**
  Patient position: Quadruped position
  Procedure:
  - Start with the quadruped position.
  - Curl backward towards your heel till it feels comfortable at the knees.
  - Tuck the head towards the knees and keep arms extended.
  - Hold for 10 seconds and then return to the starting position.
  - Gradually work upto 10 repetitions.



Figure 4.2: Backward stretch.

- **Backward stretch with fitness ball**
  Patient position: Stand in kneeling position and hands on the fitness ball.
  Procedure:
  - Stand in kneeling position and arms straight on the fitness ball.
  - Slowly curl backward towards heel till it feels it comfortable at the knees.
  - Hold for 10 seconds and then return to the starting position.
  - Gradually work upto 10 repetition.

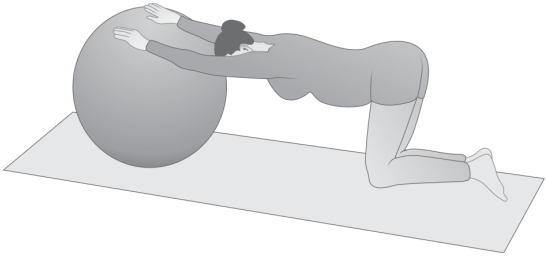

Figure 4.3: Backward stretches with fitness ball.

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❖ **Standing posterior pelvic tilt**
Patient position: Standing against the wall
Procedure:
- Stand erect against wall with feet shoulder width apart.
- Push the back against wall and try to minimize lumbar lordosis.
- Hold for 10 seconds and then return to the starting position.
- Gradually work up to 10 repetition.

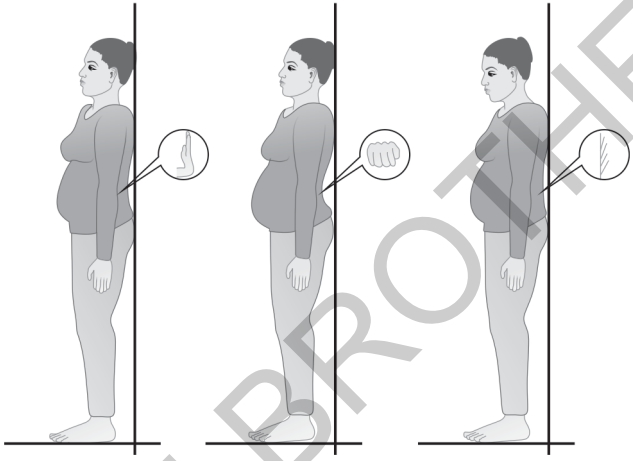

Figure 4.4: Standing pelvic tilt.

❖ **Trunk rotation**
Patient position: Sitting erect with cross legs
Procedure:
- Sit erect on the mat and legs crossed.
- Hold right foot with left hand.
- Move right hand behind you and slowly turn your upper body towards right.
- Hold till it is comfortable.
- Return to the starting position and repeat to the other side.
- Gradually work up to 10 repetitions on both the side.

Calf Stretching

It is very good exercise to prevent calf pain. Many pregnant women feel calf pain during pregnancy especially during second and third trimester. Regular calf stretching will help to prevent it and also helps to cure it.

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Salient Features

- A reference guide for physiotherapy students and clinicians
- Contains all the information about obstetric physiotherapy and also covers the advance topics like painless labor and water birth
- Contains all the relative and basic information about anatomy and physiology of female reproductive system and details of biomechanics
- Language of the book is easy-to-understand
- Enriched with tables and pictures
- Focused on evidence-based information
- Important matters have been highlighted
- Sample questions are given at the end of each chapter.

Namrata Kundariya is having a degree in MPT (Musculoskeletal and Sports Science). Currently she is working as Lecturer, Akar College of Physiotherapy, Ahmedabad, Gujarat, India. She has been an examiner to various colleges and universities like RK University, Gujarat University, North Gujarat University. She has experience of working in gynecology department, taking antenatal and postnatal classes for women during and after pregnancy. She has published articles in community magazine for the purpose of awareness and educate people about common medical problems, its treatment and prevention.

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