Hygiene of Pregnancy

What are contra-indications of pregnancy?

1. Pulmonary hypertension: associated with a 50% maternal mortality rate and a > 40% fetal mortality rate
2. Eisenmenger's syndrome: maternal mortality is 30 to 50%.

WHEN TO CALL OR GO TO THE PHYSICIAN? **On warning symptoms like:**

1. Vaginal bleeding
2. Leakage of fluid from the vagina
3. Rhythmic abdominal cramping of > 6/hour (hr)
4. Progressive and prolonged abdominal pain
5. Fever and chills
6. Painful voiding (dysuria)
7. Prolonged vomiting with inability to hold down liquids or solids for > 24 hr
8. Progressive, severe headache, visual changes, or generalized edema
9. Pronounced decrease in frequency or intensity of fetal movements

Work during Pregnancy

1. The majority of women can be reassured that it is safe to continue working during pregnancy.
2. Avoid:
   a. Heavy, repetitive lifting
   b. Long, stressful commutes to and from work
   c. Prolonged standing
   d. Heavy vibrations, such as from large machines
   e. Work activities that increase risk of falls/trauma
   f. Exposure to toxins/chemicals
3. In her office, she must avoid prolonged setting, she should move around every 2 hr to guard against lower limb venous stasis, and thrombosis

Travel

No restriction for travel even aircraft unless there is a risk factor (not put lower limbs in position compromising their circulation and venous return, so wear stockings)

General advices

1. If prolonged sitting is involved, the patient should attempt to stretch her lower extremities and walk for 10 min every 2 hr.
2. She should bring a copy of her medical record.
3. In underdeveloped areas or when traveling abroad, the usual precautions regarding ingestion of unpurified water and raw foods should be taken.

Car travel during pregnancy

1. Correct use of seatbelts (above and below the bump, not over it).
2. Maximum driving is 6 hr / day followed by rest for 2 hr.
3. During driving wear the seat belt under the abdomen.
4. Avoid discomfortable traffic ways especially in the risky condition.

Air travel during pregnancy

1. Long-air travel is associated with an increased risk of venous thrombosis, (wearing correctly fitted compression stockings is effective and will reduce the risk).
2. Airplane travel in pressurized cabin presents no additional risk to the pregnant woman, but the negative pressure (may be in the plane) has risk of premature placental separation and labor.
3. **Travelling abroad during pregnancy:** pregnant women should discuss considerations such as flying, vaccinations and travel insurance with their midwife or doctor.

Sexual Intercourse

1. No risk and restriction in normal pregnancy but avoid in the risky conditions.
2. Nipple stimulation, vaginal penetration, and orgasm may → release of oxytocin and prostaglandins → uterine contractions and may cause fetal bradycardia but no problem.
3. Avoid blowing of air into the vagina for risk of air embolism.

4. What are indications for coital abstinence during pregnancy?

1. Vaginal bleeding 2. Abdominal menstrual like pains
3. Rupture of the membranes 4. Premature dilatation of the cervix
5. History of premature delivery 6. Placenta previa
7. Placental insufficiency 8. Incompetent cervix
9. Multiple pregnancy

Clothing

1. Comfortable wide (not tight) clothes with an adequate breast support
2. **Avoid**:
   - tight girdles and socks as its constriction inhibits venous return from the lower limbs
   - high heel as it causes lordosis and backache.

General hygiene

1. ***Allow*** daily tube baths and showers with warm water and soap, ***no banyou*** to avoid entering of water into the vagina.
2. ***Avoid***.
   a. ***deodorant vaginal spray*** (absorption, fetal effect).
   b. ***vaginal douche*** except when properly indicated, use gently to avoid trauma and infection, not insert for more than 3 inches.

Care of the breast

1. Adequate support
2. ***Massage*** to open lacteal ducts and sinuses to avoid ducts obstruction which may predispose to engorgement and mastitis.

Nipple care

1. ***Repeated traction*** **in III** trimester (T3) using Vaseline and talk powder creams for cracks
2. ***Removal*** of any dry secretion by warm water and soap

Care of the teeth

At the first antenatal visit, advise women to have oral health checks and treatment, if required, as good oral health protects a woman's health and treatment can be safely provided during pregnancy.

1. ***Use toothpaste*** after meals and in morning and evening

2. The dentist must examine the teeth twice during pregnancy
3. ***Allow dental treatment even extraction***
4. ***Hypertrophy*** of gums occurs during pregnancy, more gingivitis risk

Sleep

Daily for 8 hr /night and 2 hr at the afternoon, then more sleep towards full-term, (on any side during I and II trimester while better to lie on the left side to avoid supine syndrome during III one).

Gain of weight

It is variable according to the pre-pregnant weight.

1. ***Average weight*** normal BMI: gain of 30 Pounds: P (range: 25-35 P) = 12.5 Kg distributed as 3.5 Kg for the fetus, placenta: 0.5, liquor: 1.5, uterus: 0.5, breast: 0.5, blood: 1.5, water, protein synthesis: 2 and fat: ½- 2 Kg
2. ***Over weight and obese***: gain of 15-24 P
3. ***Under weight***: gain up to 40 P

Table 1: Weight gain during pregnancy (pound)

Month	1st	2nd	3rd	4th	5th	6th	7th	8th	9th
Gain (p)	0	1	1	2	2	4	4	5.5	5.5

Common Problems during ANC

1. Nausea and vomiting
2. Fatigue
3. Ptyalism
4. Pica
5. Heart burn
6. Piles (hemorrhoids)
7. Lower limb varices
8. Excessive vaginal discharge
9. Abdominal cramps
10. Cramps of the lower limbs
11. Headache
12. Edema

Nausea and vomiting

1. Nausea and vomiting are common during the T1 (50%), usually it is mild, starts on the 6th week (wk) and it usually resolves spontaneously by 16 to 20 wk and is not generally associated with a poor pregnancy outcome
2. Morning sickness" can occur day or night
3. **Management of mild cases includes**:
   Avoidance of fatty or spicy foods Eating small, frequent meals
   Inhaling peppermint oil vapors Drinking ginger teas
   Discontinuing iron-containing multivitamins may improve symptoms.
4. If ***severe*** cases (***hyperemesis gravidarum)*** with affection of the general health resulting in dehydration, electrolyte imbalance, and malnutrition which needs treatment according its severity.
5. **Management of severe cases includes:**
   Discontinuation of vitamin/mineral supplements until symptoms subside
   Antihistamines Promethazine
   Metoclopramide Intravenous droperidol
6. ***Give examples of the anti-emetics used***
   a. pyridoxine (vit B6) or cortigen B6 injection.
   b. meclozine 25-50 mg oral or parenteral.
   c. cyclizine 50 mg oral or parenteral promezathine 25 mg.

Look for details in chapter (9) of vomiting in pregnancy

Heart burn

1. Common in pregnancy
2. Due to upward reflux of the gastric acid into the lower end of the esophagus due to pressure of the gravid uterus on the stomach with its reduced motility (relaxin and progesterone)
3. ***Advice***: use of chewing gums, avoid spicy foods
4. ***Treatment***
   a. Elimination of spicy/acidic foods
   b. Small, frequent meals
   c. Decrease amount of liquid consumed with each meal
   d. Limit food and liquid intake a few hours prior to bedtime
   e. Sleep with head elevated on pillows
   f. Utilize liquid forms of antacids and H2-receptor inhibitors
   g. Give Mg and aluminum salts but better not to use Na bicarbonate, ***why?***
      To avoid large Na load

Constipation

1. Common in pregnancy
2. ***Treatment***
   a. Increase intake of high-fiber foods
   b. Increase liquids and fluid intake and taking bran or wheat fibre supplementation
   c. Cathartic substances as prunes and raisins, and stool softeners
3. Avoid enemas, strong cathartics, and laxatives.
4. **Remember** that preparations that stimulate the bowel are more effective than those that add bulk but may cause more adverse effects such as diarrhea and abdominal pain.

What are the advices during pregnancy to avoid constipation?

1. eating foods that are high in fibre, such as whole meal breads and cereals, fruit and vegetables, and pulses, such as beans and lentils
2. exercising regularly to keep the muscles toned (at least walking)
3. drinking plenty of water
4. avoiding iron supplements, or change to a different type

Lower limbs varicosities

1. Common in pregnancy, particularly in the lower extremities and the vulva
2. ***Aggravated*** by pregnancy
3. **Risks:**
   a. Can lead to chronic pain and superficial thrombo-phlebitis
   b. Hyper-coaguable state and mechanical compression of venous blood flow to extremities → increased risk of thrombosis
4. ***Treatment is conservative*** by:
   a. Avoidance of garments that constrict at the knee and upper leg
   b. Avoid long standing
   c. Use of support stockings
   d. Increased periods of rest and elevation of legs on sitting and lying.

RCOG recommendations: varicose veins are a common symptom of pregnancy that will not cause harm and that compression stockings can improve the symptoms but will

not prevent varicose veins from emerging. [A]

What are the advices for a pregnant woman with varicose veins?

1. try to avoid standing for long periods of time
2. try not to sit with your legs crossed
3. try not to put on too much weight, as this increases the pressure
4. sit with your legs up as often as you can, to ease the discomfort
5. try sleeping with the legs higher than the rest of your body, use pillows under the ankles or put books under the foot of the bed
6. do foot exercises and other antenatal exercises, such as walking and swimming, which will help the circulation
7. foot exercises
   - bend and stretch the foot up and down 30 times
   - rotate your foot eight times one way and eight times the other

Round ligament pain (abdominal cramps)

1. ***When?*** It ***occurs during 3-4 months*** (T2) due to traction of round ligament as the uterus rises up from the pelvis
2. ***What is its nature?*** Sharp, bilateral or unilateral groin pain due to the round ligament spasm, more in right side [right dextro-rotation]
3. *It is* ***initiated*** by a sudden movement, but can occur during sleep on sudden rolling over to awaken up).
4. May be alleviated by patient getting on hands and knees with head on floor and buttocks in air
5. ***Treated*** by bed rest, analgesia (paracetamol) and local heat application (hot bath, heating pad).
6. You must ***exclude*** other GIT and UT causes by careful history, examination and urinalysis.

Hemorrhoids

1. Varicosities of the rectal veins are common in pregnancy
2. It is ***aggravated*** by pregnancy and during puerperium**.**
3. **Treatment**

   Standard hemorrhoid creams Cool sitz baths
   Stool softeners Increase fluid and fiber intake to prevent constipation
   For thrombosed hemorrhoid, do clot excision should to alleviate pain and swelling

Low backache

1. Common due to exaggerated lumbar lordosis by pregnancy but it responds to rest.
2. Typically progressive in pregnancy
3. ***Remember that rhythmic cramping pains originating in the back may signify preterm labor.***
4. **Treatment**

   Minimize time standing, rest Wear a support belt over the lower abdomen.
   Acetaminophen Exercises to increase back strength
   Supportive shoes and avoidance of high heels
   If no response to rest, consult an orthopedic specialist.

RCOG recommendations: exercising in water, massage therapy and group or individual back care classes might help to ease backache. [A]

Leg cramps

1. Occur in 50% of pregnant women, typically at night and in T3
2. Most commonly occur in the calves
3. **Treatment**
   a. Massage and stretching of the affected muscle groups is recommended.
   b. ***Give magnesium*** (lactate or citrate) chewable tablets 5 mmol (122 mg) in the morning and 10 mmol (244 mg) in the evening for 3 weeks.
   c. ***Remember that calcium*** supplements do ***not*** decrease leg cramps compared with placebo.

What are the advices for a pregnant woman to avoid lower limbs cramp?

1. Regular, gentle exercise in pregnancy, particularly ankle and leg movements, will improve the circulation and may help to prevent cramp occurring.
2. Foot exercises:
   - bend and stretch the foot vigorously up and down 30 times
   - rotate your foot eight times one way and eight times the other way
   - repeat with the other foot

Headache

1. Common in early pregnancy, but in ***T3*** you must ***exclude PIH***.
2. It responds to simple analgesia (paracetamol).
3. If no response you must search for other causes as elevated BP, CNS, …

Edema and swelling

1. ***Normal in the feet, ankle and low legs*** (hydrostatic phenomenon) which responds to elevation of the legs
2. ***Suspicious of preeclampsia:*** edema of the abdominal wall, face and bands.
3. ***Not use*** diuretics **and** ***no restriction*** of salt intake.

Carpal tunnel syndrome

1. ***Features***: pain, numbness and tingling in lateral three fingers (thumb, index middle and radial side of the ring finger) due to edema and compression of the median nerve through its passage in the tunnel in primigravida above 30 year during the III trimester, and then it disappears in the 2nd wk post-partum.
2. ***Diagnosis:*** by Tinel's test: compress the median nerve and percuss wrist and forearm with hammer will give pain.
3. ***Treatment***: analgesia, splint wrist at night, in severe case you may give cortisone injection.

Excess Vaginal Discharge and Infection

I. ***Normal excess vaginal discharge*** (**physiological leucorrhea**) due to pelvic congestion, increased cervical mucus and vaginal transudation, caused by excess estrogens

II. Abnormal *discharge* is offensive (trichomonas: TV & bacterial vaginosis: BV), with pruritis (TV and candida), or colored.

III. Diagnosis of infections

1. Wet mount in saline for trichomonads and for clue cells (gardnerella vaginalis) or BV.
2. Add 10% (KOH or NaOH) to discharge to detect candida albicans
3. Pap smear for trichomondas
4. Culture on:
   a) Nickerson's for candida
   b) Standard "culturette" for BV
   c) Thayer-Martin for gonococci
   d) Chlamydiazyme for chlamydia

IX. **Treatment during pregnancy**

1. **Candida**: local (***not oral***) by miconazole cream or ovules of 3-7 days.
2. **BV**: treat both male and female by ampicillin 500 mg caps 1x4x7, metronidazole 250 1x3x7, or clindamycin 300 tab /6hr X7 (2% local cream)
3. **Trichomonas** (treat both partners) by Flagyl 250 mg x3x7 and Povidione iodine cream.
4. **Gonorrhea** (treat both partners) by 3.5 gm ampicillin, 3 gm amoxicillin, or 2 gm spectinomycin in allergy to penicillin or resistance.
5. **Chlamydia** (both partners) by erythromycin 500 mg x 4 x 10-21 days.

Itching in late pregnancy (>32 wk) not due to liver disease: chlorpheniramine 4 mg tid decreased itching in a small trial.

Table 2: Advices for common problems during ANC

Condition	Advices
Nausea and vomiting	1. Nausea and vomiting usually resolve spontaneously by 16 to 20 wk pregnancy and is not generally associated with pregnancy complications. 2. Discontinuing iron-containing multivitamins may be advisable while symptoms are present.
Constipation	1. Increasing dietary fiber intake and taking bran or wheat fiber supplements may relieve constipation. 2. Stimulating laxatives are more effective than preparations that add bulk but are more likely to cause diarrhea or abdominal pain
Heartburn	Heartburn may be improved through maintaining upright positions, especially after meals, sleeping in a propped up position, having small frequent meals, and reducing high-fat foods and irritants such as caffeine. Antacids may also be considered for relieving heartburn.
Haemorrhoids	Hemorrhoids may be improved by increasing fiber in the diet and drinking plenty of water. If clinical symptoms remain troublesome, standard hemorrhoid creams can be considered.
Varicose veins	Varicose veins will not cause harm to the woman or baby. Compression stockings can improve symptoms but will not prevent varicose veins.
Vaginal discharge	An increase in vaginal discharge is common during pregnancy. If it is associated with itch, soreness, offensive smell or pain on passing urine, there may be an infective cause and investigation should be considered.
Backache	Exercising in water, massage therapy and group or individual back care classes might help to ease backache during pregnancy.
Pelvic pain	There is little evidence on treatments for symphysis pubis dysfunction. Many medicines for relief of bone and joint pain may not be appropriate for use in pregnancy.
Carpal tunnel syndrome	There is little evidence on treatments for carpal tunnel syndrome. Many medicines for relief of bone and joint pain may not be appropriate for use in pregnancy.

Stretch Marks

Some stretch marks (***striae gravidarum***) develop in about 50% of women by the end of pregnancy, ***how to deal with?*** **By massage with:**

1. **Trofolastin cream (***Centella asiatica* extract, tocopherol and collagen elastin hydrolases) applied daily decreases the development of stretch marks in 59%
2. **Verum ointment** (tocopherol, panthenol, hyaluronic acid, elastin, and menthol) decreases the development of stretch marks by 74%.

Can you treat stretch marks from a previous pregnancy? There is no proven treatment for stretch marks once they have developed.

Immunization

Principles

1. There is no evidence of fetal risk from inactivated virus vaccines, bacterial vaccines, toxoids, or tetanus immunoglobulin, and they should be administered as appropriate.
2. ***Safe vaccines (five):*** Yellow fever Oral polio Hepatitis B Diphtheria Tetanus
3. ***Three un-safe vaccines*** should be avoided during pregnancy: Measles Mumps Rubella
4. Viral vaccinations may be safely given to the children of pregnant women.
5. Give immune gloublin in pregnancy for exposure to: measles, hepatitis A and B, tetanus, chickenpox, or rabies
6. ***Evaluate*** all women of childbearing age for the possibility of pregnancy before immunization.
7. ***Obtain*** a relevant immunization history from all women accessing prenatal care.
8. ***Do not give*** live and/or live-attenuated virus vaccines during pregnancy.
9. ***Not terminate pregnancy*** in women received live or live-attenuated vaccines because of a teratogenic risk.
10. ***Delay pregnancy*** for at least four wk in non-pregnant women immunized with a live or live-attenuated vaccine.
11. ***Use safely*** in pregnancy inactivated viral vaccines, bacterial vaccines, and toxoids.
12. ***Immunize breast feeders*** by passive-active immunization, live or killed vaccines.

Types of immunization

I. Passive: purified human immunoglobulin (Ig): antibodies against micro organisms, (**safe**).

II. Active types

1. ***Give the safe killed vaccine***: antigen initiates reaction, as cholera, influenza, plague, rabies, tetanus, typhoid, diphtheria.
2. ***Not give the live attenuated vaccine*** (unsafe) due to risk of flaring up of infection (depressed immunity during pregnancy) as German measles, mumps, small pox.
3. ***Give the safe toxoid***: it gives passive immunity to the fetus, the famous one is tetanus toxoid (2 doses after the 4th month, (maximum 6 doses through the life)

H1N1

1. ***Treat*** with ***oseltamivir*** (Tami flu, 75 mg twice daily for 5 days) **or** ***zanamivir*** within 48 hr of onset of symptoms in pregnancy.
2. ***Offer the trivalent seasonal flu*** vaccine against H1N1v for risk pregnant women, ***as usual***.

3. Offer only a single dose of seasonal flu vaccine for pregnant women NOT in risk groups, and who have not previously had the H1N1 pandemic vaccine.

Table 3: Vaccination during pregnancy

Infection	Vaccination (immunization)
Cholera	*Use killed* vaccine before traveling if needed
Chicken pox (varicella)	*Give only* for the sero-*negative* by varicella immunoglobulin 5 units IM
Hepatitis A	*No transmission*. You may *give α globulins* as immuno-prophylaxis for both mother and neonate
Hepatitis B	*Risk of transmission on* vaccination (immunization)
Combined tetanus and diphtheria	Toxoid, *safe*, given during pregnancy 2-3 doses after the 1st trimester (maximum 6 doses of tetanus through life)
Rubella	*Contraindicated*, why? Its vaccine crosses the placenta and without satisfactory results.
Influenza	*Safe* vaccine
Advice	*Give immune-globulin on exposure to measles, hepatitis A, B tetanus, chicken pox, rabies, polio and yellow fever*

Smoking in Pregnancy

1. Inform about the specific risks of smoking during pregnancy (such as the risk of having a baby with low birth weight and preterm).
2. Women who are unable to quit smoking should reduce smoking.
3. Offer women who smoke referral for smoking cessation interventions such as cognitive behavioral therapy.

How does smoking cause damage?

1. Cigarette smoke contains thousands of chemicals, carbon monoxide and nicotine.
2. Smoking during pregnancy **increases risk** of:
   1. Preterm birth 2. Placental insufficiency
   3. Stillbirth 4. Low-birth-weight baby
   5. ***Sudden infant death syndrome*** (SIDS) after birth: healthy baby dies unexpectedly during sleep.
   6. Behavioral difficulties and chronic respiratory problems, such as asthma.

Electromagnetic Fields (EMFs)

The recent studies ***haven't shown*** **that** video display terminals **(VDTs) pose *health risks* for pregnant women even if they work at a computer all day long.**

Computers in the Workplace

The computer screen is also known as ***VDTs***. Computer screens do emit a small amount of non-ionizing radiation, but so far studies indicate that **this low level of radiation *isn't dangerous to a developing fetus***.

Electric Shock

What are the fetal effects of accidental electric shock in pregnancy?

1. There is little information available about electric shocks during pregnancy.
2. It is well documented that fetal skin is 200 times less resistant than the skin

postnatally, so less electricity may cause significantly more harm. Indeed, an amount enough to cause minimal injury to the mother may be lethal to the fetus.
3. Furthermore, the path of transmission becomes important here: the current path may completely bypass the maternal heart but, if it travels through the uterus, the fetus may be seriously injured.
4. **Fetal harm**: other than cardiac arrest, fetal complications include intrauterine growth restriction, oligo-hydramnios, reduction in fetal movements and spontaneous abortion."
5. Additional case reports were identified of renal vein thrombosis, and early infantile epileptic encephalopathy

Exposure to Violence during Pregnancy

1. 20% of all pregnant women are battered during pregnancy.
2. For some women, the violence is initiated at the time of pregnancy.
3. One half of women who are physically abused prior to pregnancy continue to be battered during pregnancy.
4. **Ask:** "Are you in a relationship in which you are being hit, kicked, slapped, or threatened?"
5. All abused patients should be given information regarding their immediate safety and referrals for counseling and support.

Environmental Hazards in Pregnancy

Chemical hazards in pregnancy

- Metals as lead, mercury, copper
- Passive smoking
- Solvents as carbon tetrachloride
- Drugs during their manufacture
- Gases as for example, carbon monoxide
- Insecticides
- Herbicides
- Disinfecting agents as ethylene oxide

Physical hazards in pregnancy

- Ionising radiation, for example, x-rays
- Noise
- Vibration
- Heat
- Humidity
- Lifting heavy loads
- Repetitive muscular work, for example, at visual display units
- Un-interrupted standing

Biological hazards in pregnancy

- Contact in crowded places—for example, in travelling to work
- Contact with higher risk group—for example, schoolchildren
- Food preparation
- Waterborne infections
- New arrivals from abroad

Activity and Exercise in Pregnancy

Introduction

1. In most cases, exercise is safe for both mother and fetus during pregnancy
2. Recommend to initiate or to continue exercise in most pregnancies to get health benefits associated with these activities
3. All women should participate aerobic strength-conditioning exercise as a part of a healthy

life style during their pregnancy

4. Goal of aerobic conditioning is to maintain a good fitness level and not for athletic competition
5. Choice of activities without fetal trauma
6. No increase in adverse pregnancy outcome in exercising women
7. Immediate postpartum pelvic floor exercise may reduce the risk of future stress incontinence
8. Moderate exercise during lactation does not affect the quantity or composition of breast milk.

General Principles

1. No data exist to indicate that a pregnant woman must decrease the intensity of her exercise or lower her target heart rate.
2. Women who exercised regularly before pregnancy should continue.
3. The form of exercise should be one with low risk of trauma, particularly abdominal.
4. Exercise that requires prolonged time in the supine position should be avoided in 2nd trimester (T2) and 3rd trimester (T3).
5. Exercise should be stopped if patient experiences oxygen deprivation → extreme fatigue, dizziness, or shortness of breath
6. ***What are benefits of exercise?*** Exercise may relieve stress, decrease anxiety, increase self-esteem, and shorten labor.
7. **Allow comfortable activities** except in high-risk pregnancy, like miscarriage, preterm labor, cervical incompetence, twins, PIH, APH, pPROM, FGR, and cardio- pulmonary disease.
8. Decrease overall performance to about 50% of non-pregnant levels during T3, ***why?*** Risk of preterm birth (PTB)
9. Avoid hyperthermia

What are relative contraindications? Exercise is contraindicated in risky pregnancy as:

1. Incompetent cervix
2. Twins after 24 week (wk)
3. History of PTL
4. Known placenta previa
5. PROM
6. PIH, essential hypertension
7. Cardiac arrhythmia and asthma.
8. FGR
9. Vaginal bleeding
10. Anemia with Hb < 10gm/dl
11. Weight extremes: under weight and obesity
12. Recurrent spontaneous abortion

What is heart rate of which should not exceed? 140 b.p.m

What are exercise programs?

2. Squatting positions: decrease incidence of forceps and shorten secondary stage labor.
3. Pelvic floor exercises benefit postpartum for muscles.
4. **Toning exercises**: help maintain proper posture and prevents low backache.
5. Semi-recumbent/sitting, not supine exercises to avoid aorto-caval compression.
6. Recreational and sports activities, okay, but orthopedic risk.
7. Jogging: do not *initiate* after pregnancy. Limit to about 2 miles per day to prevent hyperthermia and dehydration. 4–6 mile brisk walk. Pay attention to terrain and wear shoes with proper support.
8. **Aerobics**: consistent with jogging recommendations
    a. Programs should have a scientific basis.
    b. Avoid overextension + exercises on back and hard surfaces.
    c. Warm-up and cool-down should be done gradually.

Types of exercise

1. What is the best exercise during pregnancy? **Walking** for ½ hour daily is, ***why?***

a. helps venous return, sleep, and engagement in primigravida (Pg) in late weeks.
b. normalizes intestinal movements.

3. Exercise for muscles of abdomen, back and lower limbs.

4. Swimming (may be the best) is allowed in the normal 1st half but avoid in the 2nd half of pregnancy, ***why?*** Respiratory changes may make swimming difficult in late pregnancy.

a. Benefit: callisthenic exercise in water is encouraged for maintenance of strength and flexibility.
b. Avoid water that is too cold or too hot.
c. Avoid Jacuzzi temp > 38.5°C

5. Bicycling

a. Program can be started during pregnancy.
b. Stationary cycle is preferable to standard bicycling because of weight and balance changes during pregnancy.
c. Avoid out of doors during high temperatures and high pollution levels.

6. Scuba diving: **avoid, *why?*** The Fetus may be at greater risk than mother (decompression sickness, hyperoxia, hypoxia, hypercapnia and asphyxia).

RCOG Recommendation for exercise in pregnancy

1. Beginning or continuing a moderate course of exercise during pregnancy is not associated with adverse outcomes. [A]
2. **Certain activities are risky for both the mother and her fetus**, for example, contact sports, high-impact sports and vigorous racquet sports that may involve the risk of abdominal trauma, falls or excessive joint stress, and scuba diving, which may result in fetal birth defects and fetal decompression disease. [D]

Postpartum exercise

When to start?

1. May immediate after normal uncomplicated delivery as walking and pelvic floor exercise
2. 6-8 wk after CS
3. She must return gradually to pre-pregnancy exercise

What are benefits of postpartum exercise?

* Improvement of cardiovascular fitness
* Raised positive mood
* Strengthening of pelvic floor muscles
* facilitate weight loss
* reduction of anxiety and depression

Review Questions

1. ***How do maternal body weight and weight gain affect pregnancy outcome?***
2. What are risks of pre-pregnancy under or over-weight?
3. ***What is the average maternal weight gain at term?***
4. ***What is advice to pregnant women regarding work outside of the house?***
5. Describe helpful education for the pregnant patient.

TobaccoSmoking

1. What are some potential complications that have been associated with tobacco use?
2. What are the effective cessation techniques for smoking?

Alcohol

1. ***Why to avoid alcohol use during pregnancy?***

2. ***What are the features of fetal alcohol syndrome (FAS)?***
3. ***Is there a "safe" limit of alcohol consumption?***
4. ***Is there a dose/response relationship between alcohol and pregnancy outcome?***
5. ***Does alcohol cross the placenta?***
6. ***Should an alcoholic pregnant woman stop drinking on her own?***
7. ***When do the signs and symptoms of alcohol withdrawal appear during pregnancy?***
8. ***Once a pregnancy is recognized, does decreasing alcohol intake affect the rate of fetal abnormalities produced?***

Cocaine

1. ***How does cocaine affect the pregnant patient?***
2. ***What risks are associated with cocaine use during pregnancy?***
3. ***How long do cocaine metabolites remain in the urine?***

Heroin

1. What risks are incurred by opiate dependence during pregnancy?
2. What is the best treatment for opiate dependence during pregnancy?
3. Should a woman on methadone be weaned during pregnancy?
4. Does methadone prevent withdrawal in the newborn period?
5. What are the symptoms of neonatal withdrawal from heroin or methadone?
6. Is methadone harmful?
7. Should patients who abuse drugs breastfeed?
8. List the signs of substance abuse.
9. How to manage substance abuse in pregnancy?

Marijuana

1. What are the risks of marijuana use during pregnancy?
2. ***When should a woman stop smoking marijuana during pregnancy?***

Exercise during Pregnancy

1. Can pregnant women exercise during pregnancy?
2. How to advice and to put programme for exercise?
3. When the pregnant women ask for medical advice while undertaking exercise?
4. What changes in physiologic parameters are seen in exercising pregnant women compared to the non-pregnant state?
5. What maximal pulse rate should be observed by exercising pregnant women?
6. What are physiological adaptive changes affecting physical activity during pregnancy?
7. Does increased blood flow to the muscles and diversion of blood from the utero-placental bed cause fetal hypoxia?
8. What to avoid during exercise?
9. What exercise to avoid?
10. Is exercise beneficial to the fetus?
11. What are maternal benefits of exercise?
12. What are disadvantages of sedentary lifestyle?
13. What about exercise in water and hydrotherapy pool?
14. For what degree you allow exercise or measure intensity?
15. Does exercise cause miscarriage?
16. Why are pregnant women told not to exercise in the supine position after 20 wk?

17. When to terminate exercise?
18. Can competitive athletes continue exercise?

Answers

(1)

1. The optimal amount of prenatal weight gain is modified by a woman's pre-pregnancy weight for height (body mass index [BMI]).
2. Recommended total weight gain ranges from 28-40 pounds for underweight women (BMI < 19.8) to 15-25 pounds for an overweight woman (BMI > 26).
3. This translates to 0.5 kg/wk for underweight women, 0.4 kg/wk for normal weight, and 0.3 kg/week for overweight women.
4. The impact of maternal weight gain on birth weight decreases with increasing pre-pregnancy weight.
5. The pattern of weight gain through gestation is thought to be critical, in that maternal gain in the second trimester is most important for fetal growth, and is protective of fetal growth even if overall weight gain is poor.

(2)

a. Underweight women and women with low pregnancy weight gains are at higher risk for delivery of an infant weighing < 2500 gm, and the highest risk is for women with both risk factors.
b. Overweight women and women with high pregnancy weight gain are at increased risk for: **macrosomia** (birth weight > 4000 gm, > 4500 gm, or > 90% for gestational age), and **preterm delivery**
   Remember that macrosomia is a risk factor for shoulder dystocia resulting in brachial plexus injury, as well as for CS.
c. **Pre-pregnancy obesity** is a risk factor for: **hypertension** and **diabetes**, and postoperative wound infection in CS.

(3)

28 pounds, which is attributable to fetal weight, placental weight, amniotic fluid, breast enlargement, increased volume expansion, and appropriate fat stores

(4)

a. Regular employment at one's usual occupation during pregnancy, with certain adjustments and exceptions, does not contribute to increased peri-natal morbidity.
b. In general, low-risk pregnant women can continue working at their regular jobs so long as the job is not dangerous (physically or environmentally), overly strenuous, or cause physical or mental exhaustion.
c. Women with specific medical or obstetrical risk conditions who are at high risk for poor outcomes will need to discontinue work early for therapy and rest.
d. ***Remember*** that: Bodily changes that accompany pregnancy, especially late pregnancy-weight gain, fatigue, difficulty breathing, balance problems, backache-may make it difficult for some to continue working depending on the type of job and each patient's adjustment to it.
e. **Modifications of the duty or job**:
   1. Standing or walking for long periods on the job is a contributing factor to adverse pregnancy outcome.
   2. To take leave or reduce their hours as the demands of pregnancy increase in T3.
   3. Reduce the physical workload, or the woman can be transferred to less strenuous work.

4. Frequent breaks, elevation of legs, and changes in position are good ideas for all working gravidas.

(5)

1. Educating the pregnant woman about her pregnancy, labor-delivery, care of her infant and parenting, common complications of pregnancy, and general improvement in her health is an integral part of prenatal care, ***how?*** In a logical sequence, information can be presented on a one-to-one basis by the physician or nurse, via small group sessions, by videotape or posters (while the patient is sitting in the waiting room), over the Internet, and in books and handouts to be read at home.
2. Note that any reading material should be written in a manner appropriate for the individual patient's education level and in her primary language; otherwise, it will provide little or no benefit, also by childbirth preparation classes

TobaccoSmoking

(1)

1. More a mother smokes, the greater the associated risk
2. **Increased risk of**: spontaneous abortion, placental abruption, preterm delivery, premature rupture of membranes, and low-birth-weight infants
3. **No increase in congenital anomalies**
4. No known "safe" amount of cigarette smoking.
5. From experience with other toxic substances, it is assumed that the patients should be counseled that the safest approach is not to smoke at all.

(2)

1. 25% of reproductive-age women are smokers.
2. Effective techniques in controlling tobacco addiction: counseling, continued reassurance, periodic and frequent contact with a health provider, and medication.
3. Medical treatment consists of nicotine replacement, which is available either as a chewing gum or as a skin patch.

Alcohol

(1)

Maternal alcohol consumption during pregnancy is one of the most common preventable causes of birth defects and childhood disabilities (fetal alcohol syndrome: FAS).

(2)

Growth deficiency before and after birth
Abnormalities of the head and face
Behavioral disturbances
Mental retardation
Congenital heart defects
Central nervous system anomalies

(3)

No safe level of alcohol consumption, the safest thing to do is not to drink alcohol at all.

(4)

No, ***how?***

a. Daily consumption of 5 ounces of alcohol → 1/3 of the infants have FAS, 1/3 show some prenatal toxic effects, and the remaining 1/3 appear to be normal.
b. Daily consumption of 1-2 ounces of alcohol → 10% of offspring may get FAS.
c. Even smaller amounts of alcohol have been associated with FAS!

The social drinking range has been associated with persistent effects on IQ and learning problems in young children who have no apparent anatomic abnormalities.

(5)

Yes, Ethanol or ethyl alcohol crosses the placenta and the fetal blood-brain barrier freely. Fetal blood alcohol levels approximate those of the mother.

(6)

A pregnant woman who is physically dependent on alcohol requires medically supervised detoxification, **what is risk with alcohol withdrawal?** Preterm labor

(7)

Withdrawal symptoms begin when blood alcohol concentrations decline sharply after cessation or reduction, usually within 4-12 hr, even a few days after abstinence, symptoms are tremulousness, anxiety, increased heart rate, increased blood pressure, sweating, nausea, hyperreflexia, and insomnia, depending on the severity of previous alcohol dependence and the general condition of the patient.

(8)

Stopping or slowing down consumption of alcohol once pregnancy is diagnosed may lead to a decrease in anomaly rates. However, there is always a possibility that this may not be the case. Therefore, further studies are needed to evaluate this accurately.

Cocaine

(1)

1. Cocaine prevents reuptake of nor-epinephrine and dopamine.
2. The increase in nor-epinephrine → vasoconstriction, tachycardia, and rapid rise in maternal and fetal arterial pressure.
3. Uterine and placental blood flow decreases, with resultant fetal tachycardia and increased fetal oxygen consumption.
4. Uterine contractility also increases.

(2)

1. **In T1**: spontaneous abortion rate of 40%.
2. **In T3**: irregularities in placental blood flow, abruptio placentae, and premature labor and delivery and stillbirth in 8% of cocaine abusers.
3. **Fetal risks**: low birth weight, congenital anomalies, urogenital anomalies, mild neuro-dysfunction, transient electro-encephalographic abnormalities, intrauterine growth restriction, increased risk of intrauterine fetal demise, certain congenital anomalies, and cerebral infarction and seizures.
4. **Neonatal**: hyper-tonicity, spasticity and convulsions, hyper-reflexia, and irritability have been observed in children exposed to cocaine in utero.

(3)

Cocaine use can be detected in a urine sample for up to 3 days after last use.

Heroin

(1)

1. No increase in congenital anomaly rates
2. **Risks**: prematurity, intrauterine growth restriction, stillbirth, perinatal death, and multiple neonatal problems

(2)

Methadone maintenance confers several treatment benefits for the pregnant

opiate-dependent woman; it prevents fluctuations in maternal heroin levels, and removes the patient from a drug-seeking environment.

(3)

No.

(4)

No.

(5)

The classic symptom complex of neonatal abstinence syndrome (NAS) includes central nervous system hyperirritability, gastrointestinal dysfunction, respiratory distress, tremors, high-pitched cry, poor feeding, and electrolyte imbalance.

(6)

Methadone is not known to cause an increase in congenital anomalies. However, it has been reported to be associated with low birth weights.

(7)

Breastfeeding is ***not recommended***. Alcohol, cocaine, and opiates cross into the breast milk to some extent. Breastfeeding is *contraindicated* for cocaine users, because cocaine may cause significant cardiovascular changes in neonates.

(8)

Agitation	Sedation	Disorientation
Tachycardia	Hallucinations	Hypertension
Unusual skin infections		

(9)

Hospitalization may be necessary for detoxification purposes. Referral to treatment centers, social services, and counseling is important.

Marijuana

(1)

1. No association with congenital anomalies in humans
2. May be associated with increased perinatal mortality, preterm delivery, infants of lower birth weight, and premature rupture of membranes (controversy)

(2)

Therefore the safest recommendation is to avoid marijuana use throughout pregnancy.

Remember for substance abuse during pregnancy

1. There is no safe level of alcohol consumption in pregnancy; the best advice is not to drink alcohol at all.
2. Fetal effects of alcohol use in pregnancy include lower IQ scores, learning problems, and the fetal alcohol syndrome, which includes these and characteristic facial features.
3. Placental abruption and stillbirth occur in about 8% of pregnant cocaine users.
4. Pregnant women addicted to heroin should be referred to methadone maintenance programs.
5. Tobacco use is not associated with congenital anomalies but does increase the risk of miscarriage, abruption, preterm birth, PPROM, and small-for-gestational-age infants.

Exercise during pregnancy

(1)

1. In healthy women, regular exercise (three times/wk) should be encouraged over intermittent exertions.
2. Supine positions after the **T1** should be avoided (due to vena caval obstruction by the enlarging uterus).
3. Duration and intensity of exercise should be self-monitored; encourage cessation at early signs of fatigue, rather than attainment of rigid goals based on the non-pregnant state.
4. Exercises requiring balance should be avoided during the **T3** in particular.
5. Encourage careful fluid-dietary supplementation and heat dissipation.

(2)

1. First you assess fitness before advising exercise, classified as sedentary, recreational and competitive
2. Consider type, intensity, duration and frequency of exercise session with balance between benefits and harmful effects.

(3)

* Cardiac disease
* restrictive lung disease
* Bleeding in the 2nd and 3rd trimesters (**T2 &T3**)
* PIH
* PTL (previous or present)
* IUGR

(4)

1. Heart rate changes are not uniformly greater, but stroke volume and cardiac output are increased, as is hemo-concentration.
2. Interestingly, a 12% incidence of ST-segment depression on electrocardiogram (ECG) has been reported, but is not felt to be related to ischemia and has no clinical sequelae.

(5)

1. A specific target rate is no longer recommended. Pregnant women are advised to continue whatever regimen they have been following, with appropriate modifications for decreased stamina and less available oxygen reserve (which translates, for most, to cutting back on the intensity and perhaps duration of exercise).
2. Pregnancy is not a good time to begin an intensive fitness program, and episodic exercise is tolerated more poorly than a regular routine.

(6)

1. Raised joint laxity and hyper laxity due to hormonal changes increase risk of injury
2. Both pregnancy and exercise increase basal metabolic rate and temperature (temperature > 39.2 degrees is teratogenic during the **T1**.)

(7)

No, as compensatory changes occur like raised maternal hemocrit and oxygen extraction.

(8)

Avoid exercise in:

* very hot humid environment (risk of hyperthermia and dehydration)
* supine position after 16 wk due to venous cava compression
* in high attitude >2500 meters (lowering uterine blood flow) until 4-5 days

(9)

1. Diving (fetus is not protected against decompression sickness and gas embolism)
2. Caution for potential loss of balance and fetal trauma in: horseback riding, downhill skiing, ice hockey, gymnastics and cycling

(10)

Yes, less exposure for meconium, abnormal FHR and low apgar score in women who exercise preconception and throughout pregnancy as the fetuses can tolerate labor better than those for non-exercisers.

(11)

1. Physical and psychological as exercise will reduce risk or rate of:
   * Fatigue, varicosities and swelling of extremities
   * Insomnia, stress, anxiety and depression
2. Reduction of labor length and its complications
3. Improving glycemic control in GDM and even may be of preventing effect for it
4. May protective effect on coronary disease osteoporosis and hypertension

(12)

1. loss of muscular and cardiovascular fitness
2. excessive gain of weight
3. more risk of GDM and preeclampsia, varicose veins
4. more complaints as dyspnea or low backache
5. poor psychological adjustment to pregnancy

(13)

No adverse effects, it gives some compensation for physiological changes of exercise (aqua natal classes), water temperature should not exceed 32 degrees

(14)

1. Allow up to 60-70% increase of heart rate (HR) prior to pregnancy as:

Age (year)	**HR (beats/min)**
<20	140 -155
20 -29	135 -150
30 -39	130 -145
>40	125 -140

2. **Talk test**: the woman maintains conversation during exercise.
   * Degrees of exercise according to Borg's rating of perceived exertion are: Very very light (7), somewhat light (9), fairly light (11), somewhat hard (13), hard (15), very hard (17), very very hard (19)
   * Usually women will reduce intensity as pregnancy advances.
   * Start by 15 min three times/wk then increase to 30 min four times/wk to daily

(15)

No. Even vigorous exercise (such as daily running) in the **T1** has no effect on the rate of spontaneous abortion.

(16)

Because of the supine hypotension effect, even if the woman is asymptomatic, the decrease in placental blood flow due to the combination of (1) caval compression and (2) shunting to the working skeletal muscle is believed to be potentially detrimental to the fetus.

(17)

Excessive shortness of breath	Chest pain or palpitation
Dizziness	Painful uterine contractions or PTL
Leakage of liquor	Vaginal bleeding
Abdominal pain	Pelvic girdle pain
Reduced fetal movement	Dyspnea before exertion
Headache	Calf pain or swelling

(18)

Yes but under certain precautions:

1. Supervision of obstetric care provider with knowledge of effect of strenuous exercise on pregnancy outcome.
2. Be aware of proper hydration, additional nutritional requirements and risk of heat excess.
3. Routine obstetric evaluation and additional follow up for fetal growth and well being
4. Regimen should modified or discontinued if necessary

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