MATERNAL SUPPORT PRACTITIONER TRAINING

Module 4: Monitoring and Interventions during Pregnancy, Labour and Delivery + Optimal Fetal Positioning

Section 1:

Types of Tests During Pregnancy

Out of 100 babies that are born, between 1 and 5 will have a major birth defect, and many defects can be detected through prenatal testing. While some birth defects can easily be seen at birth, others such as heart, kidney, stomach or intestinal defects may not be found until after the baby goes home from the hospital, only to return with a medical emergency. It has been demonstrated that the prenatal diagnosis of birth defects will likely improve the outcome for the baby.

Whether or not to have prenatal screening or prenatal diagnosis is each woman's choice.

There are a number of prenatal screening tests and diagnostic procedures that may be done during pregnancy.

Doppler Ultrasound

Doppler flow is a type of ultrasound that uses sound waves to measure the flow of blood through a blood vessel. Waveforms of the blood flow are shown on the ultrasound screen. Doppler flow

studies may be used to assess blood flow in the umbilical blood vein and arteries, fetal brain, and fetal heart. Doppler flow is sometimes called Doppler 'velocimetry'.

A Doppler flow study is often used when an unborn baby has intrauterine growth restriction (IUGR), which means the unborn baby is smaller than normal for his/her gestational age. An unborn baby with IUGR does not necessarily have a birth defect; however, many birth defects result in small-for-gestational-age babies. The Doppler flow study may show that blood flow in the umbilical vessels is decreased, indicating that the unborn baby may not be receiving enough blood, nutrients, and oxygen from the placenta.

A specially trained physician performs this test using a technologically advanced ultrasound machine. If the test shows a decreased amount of blood flow other testing may be needed.

BHCG Blood Test

What is it?

Beta human chorionic gonadatrophin (beta hCG) is a hormone that is produced during pregnancy. It is made by cells formed in the placenta, which nourishes the egg after it has been fertilized and becomes attached to the uterine wall. Beta hCG can be found in the blood stream, therefore, a beta hCG blood test is often ordered to confirm a positive pregnancy.

When is it done?

Levels can first be detected by a blood test about 11 days after conception and about 12-14 days after conception by a urine test. Typically, the hCG levels will double every 48 - 72 hours. The level will reach its peak in the first 8 - 11 weeks of pregnancy and then will decline, remaining at lower levels for the rest of the pregnancy.

Why is it done?

To begin confirmation of pregnancy and to determine how far along the pregnancy is, although the test cannot pinpoint gestation age. Once the hCG level has risen above 2000 mIU/ml it is possible to see the gestational sac through ultrasound. If there is a concern for miscarriage, the beta hCG levels will be checked 48 hours apart to determine if the levels are rising or falling. Falling levels can indicate that the pregnancy is not progressing normally. hCG levels are also checked if there is a suspicion of an ectopic or

molar pregnancy. In the case of molar pregnancy, there is often a marked increase in hCG levels far earlier on than the gestational age would normally warrant. An elevated hCG early in the pregnancy could also indicate a multiple pregnancy.

How is it done?

A simple blood test.

Who does it?

A doctor, nurse or venipuncture technician usually draws the blood.

How long do results take?

In a hospital laboratory the result could be available in a matter of hours. In a public lab, the results may also be available in a few hours if the test is identified as STAT. In most cases the results are usually available in 1 - 2 days.

Where is it done?

At a lab or a doctors' office. It is then usually sent on to the processing laboratory for testing.

Do I have to do it?

No, not as a routine confirmation of pregnancy. It may be requested by the caregiver if there is a concern that the pregnancy is not progressing normally, such as to ruling out an adverse situation or a multiple pregnancy.

What if I don't do it?

There are no repercussions for choosing not to have a beta hCG done if the pregnancy is progressing normally. If there are concerns about the pregnancy's development and you do not wish to have the blood test, you may be putting yourself at increased health risk if the pregnancy is a mole or an ectopic one. For confirmation of multiple gestation an ultrasound would be more conclusive.

How accurate is the test?

Very accurate. Elevated levels of hCG can be found as early 9 days after ovulation, however the test is only able to identify the presence or absence of the hormone. It cannot predict outcome, or reason for the hormone's presence if it is found.

Nuchal Translucency Ultrasound or N.T. Scan

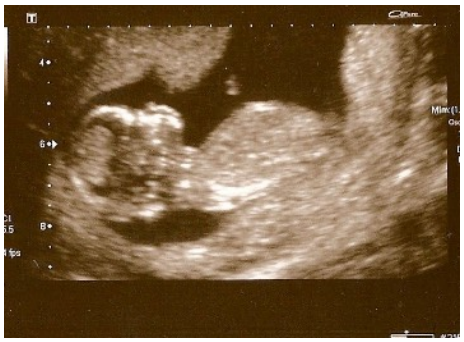
What is it?

Nuchal Translucency Ultrasound is a non-invasive test that looks for a marker known to be associated with genetic abnormalities, as well as several non-genetic abnormalities.

When is it done?

Any time between 11.5 and 13.5 weeks of gestation.

Why is it done?



To measure the thickness of the "Nuchal fold" at the back of the baby's neck. While it is normal to find some thickness at the back of the baby's neck, an association has been found between markedly increased nuchal thickness and Down's syndrome. In a multiple pregnancy it is the only non-invasive test for Down's syndrome and other developmental abnormalities that can be done. It is often used by clients who do not wish to pursue amniocentesis and would like to have their "genetic risks" identified.

How is it done?

An ultrasound or sonogram is done, often trans-abdominally, although more likely using the trans-vaginal probe.

Who does it?

A specially trained physician, a radiologist, or an ultrasonographer.

Where is it done?

The ultrasound portion of the test is usually done at a privately owned ultrasound laboratory, hospital or physician's office. The calculation to determine risk factor may have to be done at a genetics laboratory if the calculation program is not available to the ultrasound provider.

Do I have to do it?

No, it is not a medically necessary test. It is a test that is offered to clients who wish to have a non-invasive genetic risk assessment.

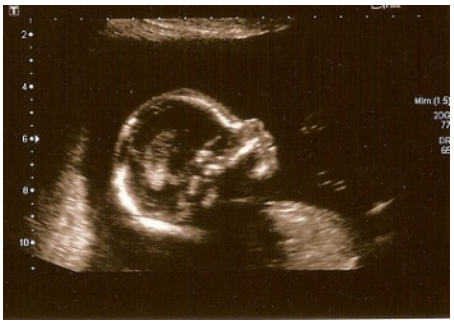
What if I don't do it?

There are no known adverse effects on either your health or the developing baby's health. If you miss the opportunity to have this test, and you are wishing to have non-invasive risk assessment done, it is possible to do so with the Maternal Serum Screen test which is done between 15.5 and 20.5 weeks of gestation.

How accurate is the test?

This test carries a low risk for false results. Statistically, the result for false positive is 5 - 8%. NT scan has an accuracy rate of 70-80% for Down's Syndrome and about 70 % of other chromosomal abnormalities, such as Trisomy 13 and 18.

Screening Ultrasound



A fetal ultrasound exam is a procedure that uses high-frequency sound waves to scan a woman's abdomen and pelvic cavity to create an image of the developing baby (fetus) and the placenta. An ultrasound can be performed at any time during the pregnancy, however, the information obtained from the test depends on the stage of pregnancy. For example, in early pregnancy, an ultrasound may be used to confirm the stage of pregnancy (determine the date of expected delivery) and to check if there is more than one baby. Between 11 and 14 weeks of pregnancy (also called the gestational age) an ultrasound may be performed in order to measure the Nuchal Translucency, information which can predict the chance of delivering a baby with a birth defect. In early pregnancy, for the purposes of detecting birth defects, ultrasound is used as a screening test.

At 18 to 20 weeks of pregnancy, a detailed ultrasound examination, called an anatomy scan, can check the baby's growth and detect certain structural (physical) birth defects such as brain, heart, lung, spinal, kidney and stomach and intestinal defects, just to name a few. At this stage in pregnancy an ultrasound can be used as both a screening and a diagnostic test. An anatomy ultrasound does not tell you if your baby has Down's Syndrome or any chromosome abnormality. Moreover, a normal ultrasound cannot guarantee the baby will be normal. Here are answers to some common questions about ultrasound.

What happens during an ultrasound?

Fetal ultrasound uses sound waves to create an image of the developing baby before birth. The "echoes" caused by sound waves bouncing off the different body tissues are converted into a picture of the fetus. Fetal ultrasound examinations are done by people who have had specialized training. They can be doctors, nurses or ultrasound technicians. The term sonographer refers to the person performing the exam, not their professional designation.

While lying down on an examination table, a gel is applied to the abdomen. A device called a transducer (which sends sound waves into the abdomen) is gently rolled over the surface of the abdomen. As the sonographer slowly moves the transducer over the abdomen, the reflected sound waves create an image of the baby on a nearby monitor. A screening ultrasound can take anywhere from 15 minutes to half an hour.

What does the sonographer look for during an ultrasound?

Ultrasound exams are used to detect or aid in the detection of abnormalities and conditions related to pregnancy. An ultrasound exam is used throughout pregnancy for the following reasons:

First Trimester -

- Confirm heartbeat
- Measure the crown-rump length or gestational age
- Count the number of babies
- Check for ectopic pregnancies
- Perform a Nuchal Translucency
  (12 week U/S test looking at the fetal neck)

Second Trimester -

- Check for structural (physical) abnormalities
- Check growth and confirm gestational age
- Confirm heartbeat

Third Trimester -

- Identify placental location
- Confirm heartbeat
- Observe baby's presentation
- Observe baby's movements
- Check the amount of amniotic fluid around the fetus/baby

An ultrasound can also be used to help doctors find the baby, placenta and amniotic fluid during diagnostic tests and procedures such as amniocentesis.

What are the risks involved?
Some research has shown small risks to the infant because of the sound and heat and many still believe ultrasounds to be a safe procedure. An ultrasound does not use x-rays or other types of potentially harmful radiation and can be done as early as the 5th week of pregnancy.

Maternal Serum Screen Testing or the Triple Screen Test

What is it?

Maternal Serum Screen Testing is a genetic risk assessment calculator comprised of:

- bloodwork
- ultrasound findings
- statistical demographics.

The **bloodwork** component consists of: Alpha Fetal Protein, beta hCG, and Estriol.

The **demographic information** collected includes: name, age, maternal racial origin, gestation and parity, weight, gestational age, diabetes, smoking, multiple gestations, LMP.

The **ultrasound findings** required is: the crown rump length and/or the biparietal diameter.

When is it done?

The test cannot be done any earlier than 15.5 weeks gestation and no later than 21 weeks gestation.

Why is it done?

Maternal Serum Screen testing is done to calculate the risk for having a baby with Trisomy 18 or 21 (Down's Syndrome) as well as calculating the risk for having a baby with a neural tube defect.

How is it done?

The information gathered from the bloodwork, ultrasound findings and statistical demographics is forwarded to a genetics laboratory, where the information is processed and the risk is calculated

Who does it?

The ultrasound component can be done at any licensed ultrasound facility. The bloodwork can be drawn at any facility and forwarded to the designated genetic lab, provided that the correct documentation accompanies it.

Where is it done?

The completed forms, along with the blood samples, are forwarded to a genetic screening laboratory for processing and risk calculation.

Do I have to do it?

No, it is not a medically necessary test

What if I don't do it?

There are no medical consequences to choosing not to undergo Maternal Serum Screen Testing. If however, after reviewing the level II ultrasound findings, it is suspected that the baby is developing abnormally, the caregiver may suggest that you undergo Maternal Serum Screen Testing to corroborate the ultrasound findings.

How accurate is the test?

Statistically the result for false positive is approximately 5%. While the risk for false negative is 2:1000.

Glucose Challenge Test (GCT) for Gestational Diabetes Screening

What is it?

This is a one hour glucose challenge.

When is it done?

The recommended time for this test to be done is early in the third trimester, around 28 weeks of gestation.

Why is it done?

This test is done to determine if you are developing Gestational Diabetes.

How is it done?

You will be given a drink containing 50 grams of glucose. You are required to complete the drink quickly, and the timed hour begins once you have completed the drink. One hour after you have finished the drink you will have a blood sample drawn.

Who does it?

This test is ordered by the caregiver.

Where is it done?

This test can be carried out in many facilities, including private laboratories, hospitals or the caregiver's site, provided that the glucose drink is available along with the personnel capable of drawing the blood.

Do I have to do it?

It is recommended by the SOGC that all pregnant women undergo the Glucose Challenge Test. Diabetes is one of the fastest rising, preventable diseases in North America. Early detection and treatment can prevent the development of Late Onset diabetes, as well as many of the health problems associated with diabetes.

Certainly anyone who has a family history of diabetes should undergo this screening.

What if I don't do it?

If you did not have this test and were not developing Gestational Diabetes, there would be no health or risk consequences to either you or the baby. If, however, you were developing Gestational Diabetes and it remained undetected there are several health risks to you and the baby.

Some commonly occurring complications include:

- macrosomia
- IDDM
- eyesight degeneration
- increased risk for Cesarean section.

Some rarer risks include:

- maternal demise
- stillbirth

How accurate is this test?

This test falsely screens positive in approximately 20% of women who are not developing Gestational Diabetes.

Glucose Tolerance Test (GTT)

What is it?

This is a two hour test to see how much difficulty the body is having in processing glucose.

When is it done?

This test is done if the Glucose Challenge Test comes back showing that the body was not processing the 50 grams of glucose in an hour.

Why is it done?

This test is done to determine if you have developed Gestational Diabetes.

How is it done?

For 3 days prior to undergoing a GTT you will be requested to maintain a healthy diet of no more than 150 to 200 grams (g) of carbohydrates. In addition, you will be asked to avoid strenuous activity for approximately 8 hours before the test. Similar to the Glucose Challenge this is also a fasting test. Before drinking the glucose solution, a blood sample is taken to establish a baseline. You will then be given a drink containing 75 grams of glucose. You are required to complete the drink quickly. Blood samples will be taken at hour one and hour two once you have completed the drink.

Who does it?

This test is ordered by the caregiver.

Where is it done?

This test can be carried out in many facilities, including private laboratories, hospitals or the caregiver's site, provided that the glucose drink is available along with the personnel capable of drawing the blood.

Do I have to do it?

This test is strongly recommended if the GCT shows that you are not processing glucose as expected. Having an abnormal GCT does not necessarily mean that you have developed Gestational Diabetes. It can mean that the body takes longer than the standard hour to process the glucose load. Without the two hour test there is no way to determine if the body is functioning normally or beginning to have difficulty coping with the pregnancy.

What if I don't do it?

If you did not have this test and had not developed Gestational Diabetes, there would be no health or risk consequences to either you or the baby, however, if you had developed Gestational Diabetes and it remained undetected there are several health risks to you and the baby.

Some commonly occurring complications include:

- Uncontrolled Gestational Diabetes
- Developing insulin dependent diabetes
- Organ failure
- Macrosomia
- IDDM
- Eyesight degeneration
- Increased risk for Cesarean section.

The risk for maternal demise and stillbirth increases significantly in women with uncontrolled Gestational Diabetes.

How accurate is this test?

This test can accurately confirm the development of gestational diabetes.

Cervical Competence Ultrasound

What is it?

This is an ultrasound scan.

When is it done?

This test may be done prior to becoming pregnant if there is a suspicion of cervical incompetence, or prior history of surgery on the cervix. It can also be done throughout the pregnancy to observe and record the cervical situation.

Why is it done?

When this ultrasound is done prior to pregnancy the discovery of a short cervix may suggest to the caregiver that, as a precautionary measure, a cervical stitch be inserted into the cervix to help keep it closed. The same would apply If there is a prior history of cervical incompetence or prior cervical surgery. In later pregnancy, identifying cervical changes prior to their becoming dire can lead the caregiver to initiate changes in the care protocol which can reduce the onset of premature labour and/or delivery.

How is it done?

While it may be possible to view the cervix trans-abdominally in most cases, it is a trans-vaginal probe that is used.

Who does it?

A specially trained physician, usually an obstetrician or perinatologist, a radiologist or an ultrasonography technician will perform this procedure.

Where is it done?

In a privately owned ultrasound laboratory, a hospital laboratory or the physician's office

Do I have to do it?

This is not a test that would be routinely offered by a caregiver without just cause.

What if I don't do it?

A failure to undergo this test could put the pregnancy at grave risk if the cervix was becoming shorter, or losing its competence.

How accurate is this test?

This test is very accurate in determining cervical length and any changes that occur if slight pressure is applied. What this test cannot do is predict what will happen to the cervix as the pregnancy continues.

Non Stress Test

What is it?

This is a test that measures the fetal heart rate and uterine activity.

When is it done?

This test is used if a biophysical score is below normal, if there has been a noted decrease in fetal activity, if feelings of labour are happening prematurely, or if the pregnancy is post dates.

Why is it done?

This test is done to see if there is any change to the fetal heart rate when there is uterine activity. While it is expected that the fetal heart rate will be affected by any uterine activity the NST looks to see that the fetal heart rate returns to normal once the uterine activity has stopped. If the NST reveals that the fetal heart rate is behaving differently than expected intervention may be required.

How is it done?

There are two electronic transducers, one that acts like a stethoscope, to pick up the fetal heart and a second transducer that is similar to an ECG electrode; it measures the force and frequency of the uterine activity.

Who does it?

This test is performed by a member of the medical team, usually a nurse, physician or midwife. The result must be reviewed by a physician or midwife, as they are responsible for deciding what course of action to pursue, based on the findings.

Where is it done?

This test is usually done at a hospital facility.

Do I have to do it?

This test is not routinely ordered unless there is concern for the health of the fetus. It is likely that you would be strongly advised to undergo this test if a situation arose that warranted its use.

What if I don't do it?

If you were advised to undergo this test and you chose not to, you could be compromising the baby's health.

How accurate is this test?

While this test can accurately reflect what is happening with the fetal heart rate, especially in relation to uterine contractions, it cannot determine why the fetal heart rate is or is not responding as expected. A Biophysical Profile would be required to clarify the NST result. This is especially indicated when the fetal heart rate is not responding to the uterine activity due to deep sleeping on the part of the baby.

BioPhysical Profile

What is it?

This is an ultrasound that is done to ensure continued fetal well being and to ensure that the integrity of the uterine environment remains intact.

When is it done?

This ultrasound is done whenever the caregiver feels the pregnancy is at risk, such as:

- contraction of Parvo B19 virus
- a previous history of stillbirth
- previous history of placental insufficiencies
- babies that are small for gestational age
- multiple gestation
- post dates
- fetal anomalies
- maternal health issues such as diabetes.

Why is it done?

This ultrasound is done to ensure that the baby or babies are continuing to develop normally and that the placenta is still functioning at an optimal level.

How is it done?

This is a trans-abdominal ultrasound.

Who does it?

This will be performed by an ultrasound technician, radiologist, or a specially trained physician.

Where is it done?

This is done at a licensed private facility, medical clinic or hospital.

Do I have to do it?

This test is not routinely ordered unless there is concern for the health of the fetus. It is therefore likely that you would be strongly advised to undergo this test if a situation arose that warranted its use.

What if I don't do it?

If you were advised to undergo this test and you chose not to, you could be compromising the baby's health.

How accurate is this test?

This test is very accurate at determining the fetal well being. It can identify changes in environmental circumstance, such as low amniotic fluid volume and placental calcification. It is not, however, capable of independently offering any predictive values; that requires the interpretation of the caregiver.

Section 2:

Non-invasive blood/swab tests

blood group

in case of transfusion. O is most common (+/-) then A, AB, B

RhD positive or RhD negative = Rhesus factor

- Rhesus factor is fixed by your genes
- If you're rhesus positive (RhD positive) , it means that a protein (D antigen) is found on the surface of your red blood cells
- An absence of the D antigen means you are RhD negative
- Most people are RhD positive
- It becomes risky if mother is (-) and father is (+) – can produce child RhD (+)
- Mother's and baby's blood systems are separate but there are times when the baby's blood can enter the mother's system. If the baby is RhD(+) and mother is RhD (-) and the baby's blood enters the mother's system this could cause the mother's

immune system to create antibodies against Rh to fight off the 'intruder/fetus' – treating RhD (+) baby as an intruder. If this happens the mother is said to be 'sensitized'.

- If birthing parent is RhD (-) they will be given RhoGAM shot at 28 weeks and 72 hours after delivering the baby

Hemoglobin level

- blood volume increases by 40% so optimal hemoglobin level are important in order to carry oxygen to all of the red blood cells. Iron makes hemoglobin. If there is an iron deficiency or it is simply not high enough the birthing parent will not be permitted to have a home birth. It may be advised to get an iron supplement.

GBS

- group B streptococcus – common bacteria in vagina, rectum, urinary tract of 25% of women
- infection causes no problem to women before pregnancy but DURING pregnancy can cause illness and in newborn after delivery
- GBS may cause chorioamnionitis (infection of placental tissues) and postpartum infection
- UTI's caused by GBS can lead to preterm labor and birth
- swab is done between 35-37 weeks gestation

Prevention of GBS
Healthy bacteria, vitamin c, garlic/bacterial suppositories, Echinacea tea, extra sleep, bee propolis, exercise stimulates immune system, perineal wash with tea tree oil

Treatment
antibiotics, grapefruit seed extract

Immunity to rubella (german measles), syphilis and hep B

(see TORCHES)

*offered HIV/AIDS, toxoplasmosis

*offered papsmear to detect herpes (HSV-2), gonorrhea

*If there is cause for concern.

Section 3:

Extensive/Invasive Tests

Magnetic Resonance Imaging

Magnetic Resonance Imaging (MRI) is a non-invasive procedure that uses powerful magnets and radio waves to construct pictures of the body. A powerful magnet generates a magnetic field roughly 10,000 times stronger than the natural background magnetism from the earth. Hydrogen atoms within a human body will align with this field. When the focused radio wave pulses towards the aligned hydrogen atoms in tissues of interest, they will return a signal. The subtle difference in the signals rebounding from different tissues is translated into images which enables the MRI to identify organs and the contrast between tissues within the organs. These imaging planes or 'slices' are stored in a computer, or printed on film. MRI can easily be performed through clothing and bones.

What Is Involved With an MRI Scan?
The MRI scanner is like a big square box with a tunnel through the middle. During an MRI scan you have to lie very still in the tunnel, usually on your back, but if this is not possible you may be able to lie on your side.

The table that you lie on is narrow. You can talk to the MRI technologist performing the scan. The scan usually takes up to 30 minutes.

Foam cushions and soft straps are used to help you be comfortable and keep still. You will wear earplugs or headphones to muffle the loud "knocking" noise of the machine; it is actually incredibly loud.

How is the test performed?
The MRI scanner is located within a specially-shielded room to avoid interference from other radio waves. As MRI relies on magnets, all metal objects such as earrings and certain clothing must be removed. Lying down on a narrow table which slides into a large tunnel-like tube, the pregnant woman is asked to lie very still since excessive movement can blur MRI images and cause certain artifacts.

Is MRI Safe?
The magnetic field and radio waves are believed to be safe and no negative effects on unborn babies have been reported with normal use. There is no ionizing radiation (e.g. x-rays) used in MRI.

Amniocentesis

What is it?

Amniocentesis is an invasive procedure that is undertaken for the withdrawal of amniotic fluid.

When is it done?

It is usually done at 16 weeks gestation, for early chromosome analysis. Amniocentesis may also be done at a later time in the pregnancy for chromosome analysis or for determining fetal lung maturity.

Why is it done?

Amniocentesis is primarily done to determine if there are any chromosomal abnormalities associated with the pregnancy. Amniocentesis is also used to determine the state of fetal lung maturity if a baby needs to be prematurely delivered.

How is it done?

Using an ultrasound for guidance, a long needle is inserted through the mother's belly and into the amniotic sac. A small amount of amniotic fluid is drawn into the syringe. The needle is then withdrawn.

Who does it?

A specially trained obstetrician, known as a perinatologist, performs this procedure.

Where is it done?

Amniocentesis is done in a hospital.

Do I have to do it?

Amniocentesis is not a medically required procedure. It is, however, a procedure that may be strongly recommended if there are concerns regarding the baby's development, or if circumstances arise that would require the premature delivery of the baby.

What if I don't do it?

If the baby is developing abnormally, amniocentesis will not change this. It can only tell if there is an abnormality; it cannot predict the pregnancy outcome. However, there are some chromosomal abnormalities, such as Trisomy 21, which have been identified as having very specific characteristics that produce constant and predictable outcomes. If it is recommended that you undergo amniocentesis to determine fetal lung maturity and you choose not to do so, you may be putting yourself and the baby's health at risk. You may also be creating a circumstance in which a more urgent and potentially dangerous situation arises.

How accurate is this test?

Amniocentesis can identify a large number of chromosomal anomalies. This number is constantly evolving as technologies continue to advance. Amniocentesis can also accurately determine the maturity of fetal lungs.

What amniocentesis cannot do is predict the degree of affliction that the chromosomal anomalies will influence.

For example, while Down's Syndrome can be readily identified by its signature chromosomal anomalies of an extra copy of chromosome 21, the complications commonly associated with this anomaly cannot be determined.

Amniocentesis cannot predict the occurrence of any structural abnormalities, such as "Club Foot", unless the abnormality occurs as a result of a chromosomal anomaly. It is not uncommon for a fetus who is found to have a structural abnormality to have a chromosome analysis that shows no chromosomal anomaly.

Chorionic Villus Sampling or CVS

What is it?

Chorionic Villus Sampling is an invasive (enters the body) test that screens for a variety of genetic abnormalities.

When is it done?

CVS is usually done around 12 weeks gestation.

Why is it done?

If there is a maternal or fraternal family history of genetic abnormality, a previous pregnancy with a genetic abnormality, a risk factor such as maternal age is over 35 at the time of delivery.

How is it done?

Using ultrasound for guidance, a small tube, called a cannula, is carefully inserted up though the cervix to the developing site of the placenta, called the chorion. The approach can also be made through the abdomen. Once the chorionic villae has been identified, a small amount of chorion tissue is taken.

Who does it?

CVS is usually performed by a perinatologist, or a specially trained physician.

Where is it done?

It is usually done at a hospital, under sterile conditions.

Do I have to do it?

No, it is not a medically necessary procedure. This procedure carries a risk for pregnancy loss of approximately 3%. 3 out of 100 pregnancies will miscarry as a direct result of the CVS procedure. You may however be advised to consider undergoing CVS if there are risk factors that could have an impact on the developing pregnancy.

What if I don't do it?

Nothing will happen to either the developing baby or yourself if you choose not to undergo CVS. If you do not wish to put the pregnancy at risk, or if you would not intervene with the pregnancy, regardless of any abnormalities that might be found, then this test may not be useful to you.

How accurate is the test?

Some chromosomal abnormalities are not found with this test. This can mean an opportunity to undergo a second invasive procedure, amniocentesis, if the pregnancy is later found to have any abnormalities developing, or if complications in the pregnancy arise, such as polyhydramnios (an excessive amount of amniotic fluid) that are associated with chromosomal abnormalities. CVS cannot screen for neural tube defects, such as Spina Bifida.

Amnioinfusion

An amnioinfusion is when a fluid other than blood, such as saline solution is passed through a needle into the amniotic sac containing the baby.

The procedure is very much like a 'reverse' amniocentesis.

Fluid is put back into the uterus rather than taken out. It is most often done when there is severe oligohydramnios (a complete lack of fluid around the baby).

Amnioreduction

An amnioreduction is the withdrawal or reduction of amniotic fluid from the amniotic sac containing the baby.

An amnioreduction is most often done when there is polyhydramnios, or a very large increase in amniotic fluid around the baby. Withdrawing the fluid out of the uterus allows the mother to be more comfortable and also decreases the risk of premature labour.

Fetal Drug Therapy

In some cases when there is a problem with the fetus, drug therapy can be given to the mother, whereby the drugs pass through the placenta to the fetus. For example, some unborn babies will develop an irregular heartbeat, which if left untreated will cause serious consequences for the baby. Drugs given to the mother can improve the baby's heart function. In some cases, the drug must be administered directly to the baby. In these situations, a fetal blood sampling procedure would be performed to administer the drug.

The same risks that apply to Fetal Blood Sampling would apply to this procedure.

Fetal Endoscopy

An endoscope is a device consisting of a tube that contains flexible optic (light) fibres.

For fetal endoscopy, the tube is inserted into the uterus to allow the doctor to examine the baby more closely. The picture may be viewed on a video screen.

There are some rare complications of pregnancy that may be improved with the use of endoscopic procedures:

1. Laser surgery on the placenta in severe, early cases of Twin to Twin Transfusion Syndrome (TTTS).

2. Cord occlusion in acardiac twins where death of one twin is inevitable and if left untreated would put the co-twin at risk of death or brain damage. Umbilical cord ligation, a minimally invasive operative technique that ties off the umbilical cord of the acardiac twin, increasing the chance of survival of the normal twin to 70-80%.

3. Division of amniotic bands which constrict a limb and if left untreated, would result in amputation.

4. Identification or clarification of rare fetal anatomical problems, where the diagnosis is unclear.

Fetal Intravascular Transfusion (IVT)

A blood transfusion is given to the baby inside the uterus to treat the effects of anemia caused by Rh sensitization. During the transfusion, Rh-negative blood is given to the baby. The fresh blood provided by the transfusion replaces the red blood cells that have been destroyed by the mother's immune system.

Using ultrasound for guidance, a fine needle is passed into the umbilical vein, or into the baby's liver (intrahepatic vein). A muscle relaxant may be given to quiet the baby's activity and reduce the chance of the needle being moved. Donor red blood cells are given to the baby to restore the haemoglobin to normal. Transfusions are repeated throughout the pregnancy until the baby is born.

The procedure related risks are the same risks as those for Fetal Blood Sampling, however, since the procedure takes longer and is more complicated the risks are increased.

Pleuro Amniotic Shunting

Pleuro Amniotic shunting is the placement of small plastic tubes into the fetal chest to allow the collected pleural (lung) fluid to flow into the amniotic sac and let the lungs expand and grow normally. The shunt is necessary because of an abnormal collection of fluid between the thin layers of tissue (pleura) lining the lung and the wall of the chest cavity. This fluid squishes the lungs and they cannot grow normally. The most common reason for a pleuro amniotic shunt insertion is for the treatment of a chylothorax.

Bishop's score

Pre-labour test to see if induction of labour would be required. It is out of 13 and the higher that score, the better chance of spontaneous vaginal delivery. The lower the score, cervical ripening may need to be used before any other procedure and induction may be required. The test looks at Cervical Position, Effacement, Dilation, Softness, and Fetal Station. Each one is scored on a 0-2 or 0-3 scale. 1 point is added or subtracted for various special circumstances such as previous vaginal deliveries or PPROM respectively.

Section 4:

Induction and Augmentation

Induction drugs

- Pitocin: Given via IV and promotes strong and regular uterine contractions by changing the calcium concentration in uterine muscle cells. They may become too intense too quickly causing the mother to need pain medications (which carry their own risks). Can also cause headaches and increased BP.
- Cytotec: Given via IV to start uterine contractions, however, there is a risk of uterine rupture if used to start labour.
- Cervidil: Applied to the cervix and starts uterine contractions within 6 hours. Can cause nausea, stomach pain, or back pain.

Rupture of Membranes

- when the bag of water is broken artificially, aka AROM, which stands for Artificial Rupture of Membranes
- may be done as an induction technique if the cervix is soft, ripe, and open a bit, or after other induction methods have been introduced (such as cervidil, for example)
- may also be used as a means to 'speed up' or augment labour if it is slow or stalled
- it can be a great technique to use if a woman is having a premature urge to push as sometimes the bag of water pushing on the cervix creates the same urge, but pushing with a not fully dilated cervix can cause it to swell and be detrimental to labour progress

Three ways to naturally augment labour:

- Nipple Stimulation - releases oxytocin
- Walking - releases endorphins, gets baby nice and low
- Sexual intercourse/clitoral stimulation - releases oxytocin
- Others?

Section 5:

Optimal Fetal Positioning

Fetal positions

Vertex
Fetus head down presentation, which is how we want baby for optimal birthing position. Can be occiput posterior or occiput anterior (left or right).

Breech
Fetus presenting with a head up position. Three types: footling breech, frank breech, complete breech. This can lead to an operative birth, depending on healthcare practitioner and fetal positioning.

Transverse
Fetus is in a lying sideways position (with fetus' head at one of the mother's hips). This is normal in the second trimester, but we expect babies to be head down as we enter the third trimester. If this is discovered to be the fetal position in labour or late pregnancy, this will lead to an operative birth.

If the baby has not moved into the proper position for labour and delivery by 34 weeks there is much we can do to 'guide' the baby into the optimal head down LOA position. Note that the SOGC's guidelines for automatic elective cesarean for breech presentation has changed since 2009. Trial of labour should be presented as an option for women with a singleton frank or complete breech fetus at full term, with a few contraindications.

https://docs.google.com/viewer?url=http://sogc.org/wp-content/uploads/2013/01/gui226CPG0906.pdf&chrome=true

Avoiding poor fetal positioning

The best comfort measure is avoiding discomfort in the first place. A less than optimal fetal position (especially if the baby is sunny side up or posterior) can cause a lot of discomfort for the birthing parent (back labour). During the last 6 weeks of labour a pregnant mother should become more aware of posture, avoid slouching (car, chair) and crossing legs.

Great resource: www.spinningbabies.com

- Proper posture - spine neutral, level pelvis
- Watch TV kneeling over ball or lying on your left side or leaning backward on a chair, taylor sitting
- Sit on wedge cushion in car so your pelvis is tilted anteriorly
- Try not to cross your legs, reduces space at the front of your pelvis, babies need lots of space at the front.
- Avoid deep squatting within 6 weeks of due date
- Swimming, breaststroke, front flutter kick
- Hands and knees
- Lying on belly with pillows all around (hips stacked)

Turning a Breech Baby

When you can't turn the baby, turn the mom.

A wonderful resource we often refer clients to when they wish to turn their their baby is www.spinningbabies.com. There are also many postures you can do in class or recommend for home practice, although some postures may require a 'spotter'.

- Psoas Stretch - As mentioned in the anatomy section, during pregnancy (and even for most people) the psoas can become tight/weak and enlarged, restricting room for the baby to move or descend into the pelvis. It also compromises alignment of the spine, further restricting space and fetal descent.
- Forward Leaning Inversion - Designed to stretch and lengthen the lower uterine ligaments (uterosacral ligament) and create more space and balance. With knees on a high surface, come down slowly onto the forearms and be sure belly and neck are relaxed. Hold the pose for 30 seconds, then walk back up onto the arms and, with assistance, come up to a kneeling position.

Do not do this position if client has high blood pressure or baby reacts with frantic movements during the position. The forward leaning inversion is recommended at any weeks gestation for any fetal position.

- Breech Tilt - This pose uses the lengthening of the uterine ligaments and gravity to help turn the baby. The weight of the baby creates a neck flexion and helps the baby to flip if there is enough room in the lower uterus. It requires lying on a board with head down for up to 20 min 3x a day. As always, this is best done with a spotter and always come down if you feel faint or discomfort.

- Open Knee-Chest Position - From a hands and knees position, come down onto the upper chest, lifting the bottom higher than your head, which creates more space in the pelvis. This should only be done for breech babies during pregnancy or in labour when a baby is engaged into the pelvis in a poor position (this helps them come out of the pelvis and 'reset' their position).

- Aquafit Handstand - If you are an aquafit instructor, you may recommend a handstand in the water if they are comfortable with this movement.

- Chiropractor - Webster technique

- Moxibustion and acupuncture

- Webster technique

- Light/Music at the vagina

- Hot bottom, cold top of belly (Ex. heat pad and frozen peas)

How to turn a Posterior Baby

Posterior babies are becoming more common as prolonged sitting and poor posture become more common. When you are seated or standing in a slouched position with your tail tucked, gravity pulls the heaviest part of the baby (the spine) downwards towards your spine, creating a posterior position. Posterior babies can cause extreme discomfort during birth as the hardest part of the baby is pressing on the sacrum during descent. This is often termed 'back labour'. The key to avoiding a posterior baby is to have great posture and do poses that counteract this pull of gravity. Avoid breech tilt and open knee-chest postures with a posterior baby, baby is head down, let's not mess with that!

- Psoas stretches. (See Above)
- Forward Leaning Inversion. (See Above)
- Hands and knees posture. We recommend leaning over a birth ball so this posture can become a resting pose. With the belly down, the abdomen creates a hammock for the baby and gravity pulls the baby's spine downward into a posterior position. This should be done frequently during pregnancy and can be used during labour as well. You can also choose to do the cat/cow pelvic exercise to help the baby move.
- Avoid deep squats when baby is in less than optimal position
- Chiropractor - Webster technique
- Moxibustion and acupuncture
- Webster technique
- Swimming (flutter kick)

Alternative Options for Turning Babies

It is important that we take steps to turn babies when there is enough room to turn them. If at 34 weeks your client has a breech/ transverse/posterior baby, you can show them the postures above as well as direct them to alternative health care providers that may offer more assistance. Specially trained chiropractors use the Webster technique to release tight ligaments and give the baby enough space to turn, acupuncture and moxibustion with a

naturopath or Chinese Medicine doctor has been proven to have a high success rate with turning babies as well.

If the baby has still not turned from breech to head down and labour is just around the corner, a doctor or midwife may recommend an External Cephalic Version (ECV) to manually turn the baby. Depending on the care provider, this could be a highly medicalized procedure and may need to be done in an operating room. Success is also dependant on the skill of the care provider in this technique. An ECV can be very uncomfortable and comes with its own set of risks. Encourage clients to discuss these with their healthcare provider.

OP Babies During Labour

If given the chance most OP babies will turn into a proper OA position during labour as they flex their neck and make their way through the pelvis. If their neck does not flex they may become acynclitic or present face first. They may enter the pelvic outlet in an OP position but rotate in the pelvic cavity before making his way through the outlet.

Characteristics of an OP baby

- Kicks to the front (feeling fingers above pubic bone)
- Postdates
- Irregular start to labour (start stop)/long early labour
- Characteristics of transition in early labour (contractions close together/coupling)
- Back labour/pain
- Early urge to push

What to do:

- Avoid epi and amniotomy
- Hands and knees, with towel or blanket to lift up belly, rock pelvis, cat/dog (robozo)

- Rock during labor, on birth ball or with partner
- Walking sideways up stairs, step on and off stool, one foot up on stool
- Walking
- Kneeling on one knee
- Avoid Lying on back
- Side lying release
- Lift and tuck, early labour (baby tuck chin)
- Miles Circuit

The Cardinal Movements of Labour

1. **Engagement** – the widest part of the baby's head reaches the level of the ischial spines in the pelvis. When this occurs, a care provider refers to the station of the baby as either 'spines' station.

2. **Descent** – movement of the presenting part of the baby's head (most commonly the back of the baby's head, also knows as the occiput) downwards until it reaches the pelvic inlet.

3. **Flexion** – When the baby's head reaches the level of the pelvic floor, there is more resistance from the muscles which cause the baby to flex its neck, bringing its chin to its chest; this creates the smallest diameter for passing through the pelvic inlet.

4. **Internal Rotation** – the baby rotates its head out of alignment with the rest of its body so that the long part of the baby's head can pass through the long part of the pelvic inlet

5. **Extension** – Once internal rotation is complete, the baby's head reaches the bottom of the pubic symphysis, then continues through the rest of the birth canal, the baby must now extend its neck and head lifting its chin off its chest and

performing a 'looking up' position. The baby's head passes under the pubic bone (the hardest part of the pushing phase!) with the power of the contractions as well as the pelvic floor.

6. **External Rotation** – a baby's head is long from front to back whereas its shoulders are long from side to side, therefore the 'long parts' of a baby's head and shoulders are perpendicular to each other. Once the head is delivered, it rotates back into alignment with the rest of its body so that the shoulders can pass through the pelvic inlet.

7. **Expulsion** – The rest of the baby's body is delivered as the shoulders pass through the pelvic inlet with the anterior (at the front of the mother's body) shoulder first and the posterior (at the back of the mother's body) shoulder second. This process is usually just one or two pushes.

Video of the Cardinal Motions: http://www.youtube.com/watch?v=Xath6kOfoNE

