Sunnybrook
HEALTH SCIENCES CENTRE

DFCM ROUTINE PRENATAL CHECKLIST

Time Period	Discussion Topics	Checklist
Preconception	• Nutrition and weight gain[1] • Exercise[2] • Smoking/EtOH/MJ/drugs/caffeine[3] • Prescription medications[4] • Work exposure (i.e. radiation, toxins) • FHx congenital anomalies/hereditary d/o[5]	○ Check Rubella ± Varicella immunity[6] ○ Check HIV[7] ○ Recommend folate supplementation[8] ○ Maternal age ≥40 → discuss risks[9]
First prenatal	• Above topics if not discussed • Prenatal screening[10] • Risks of infections[11] • Nausea and vomiting of pregnancy[12] • Indications for low dose ASA[13]	○ Complete AN1 ○ Schedule dating US if LMP uncertain[14] ○ Schedule NT at 11-13+6 weeks ○ Give eFTS requisition/NIPT ○ Give requisition for 1st trimester BW[15] (CBC, group & screen, ferritin, TSH, VDRL, HBsAg, rubella Ab, varicella Ab, Urine dip/urinalysis, C&S, Chlamydia, GC)[16] ○ Add testing for A1c/FPG if at risk for DM[17] ○ Consider added tests if high/genetic risk ○ Flu vaccine (seasonal)[18]
Prenatal physical (12 weeks)	• TOLAC if applicable[19]	○ Pap smear if due ○ BV swab if symptomatic or high risk[20] ○ Schedule anatomy US (18-22 wks)
16 -20 weeks	• Review 1st trimester US and lab results • Recommend prenatal classes • Quickening (onset of FM) • Review screening results (call)	○ Discuss when to contact MD[21] ○ Correct EDD based on 1st trimester US
20-27 weeks	• Review anatomy US results[22] • Cord blood[23]	○ Obtain consent and submit order for RhIg for Rh -ve women[24] ○ Provide 2nd trimester requisition (24-28 wks) (CBC, ferritin, GCT/GTT, ± group & screen[25], Any abnormal result from prior)
27-34 weeks	• Review 2nd trimester lab results • Review kick counts[26] • Discuss expectations, fears, family adjustment, violence	○ Offer Tdap from 27-32 weeks[27] ○ Administer RhIg to Rh -ve women at 28 wks ○ Repeat US at 30-32 weeks if necessary (previa, obstructing fibroid, etc.)[28]
34-37 weeks	• Review reasons to come to triage • Discuss circumcision[29]	○ Fax AN records to OB Triage ○ GBS swab (35-37 wks)[30] ○ Discontinue ASA at 36 wks ○ Start antivirals at 36 wks if Hx of genital HSV[31]
37-40 weeks	• Review signs of labour[32] • Discuss pain management • Discuss breastfeeding	○ Schedule BPP starting at 38 wks if ≥40 y/o
>40 weeks	• Discuss possibility of induction[33]	○ Schedule BPP q 3-4 days ○ Book induction

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Revised November 2018 – Dr. N. Gelber, Dr. S. Domb, Dr. M. Shuman

ROUTINE PRENATAL CHECKLIST RESOURCE

[1]Nutrition and Weight Gain

During the 1st trimester, no extra calories are required, but caloric needs increase slightly during the 2nd and 3rd trimesters. Fluid needs increase in pregnancy to 10 cups/day due to rise in volume requirements. According to Canada's Food Guide, a diet during pregnancy should contain 2200-2400 kcal/day.

With obesity becoming an increasingly prevalent concern, it is critical to perform pre-pregnancy BMI measurements and offer counseling regarding appropriate weight gain. Obese women should be advised of the increased risk of complications including cardiac disease, pulmonary disease, gestational hypertension, gestational diabetes, and obstructive sleep apnea. In addition, their fetus is at increased risk of congenital anomalies and spontaneous abortion. These women are also at significantly higher risk of requiring C-sections.

Weight gain in pregnancy based on pre-pregnancy maternal weight:

Underweight (BMI <19)	Average (BMI 19-25)	Overweight (BMI >25)
28-40 lbs	25-35 lbs	15-25 lbs
12-18 kg	11-16 kg	7-12 kg

Safe Foods in Pregnancy - previously thought to be unsafe

- Soft-ripened cheeses, deli meats, and refrigerated ready to eat foods (including cheese from unpasteurized milk) – associated pathogen is *listeria monocytogenes*. Risk is low if food is handled and stored properly and may therefore be consumed in moderation if obtained from reputable sources
- Raw or soft-cooked eggs: associated pathogen is *salmonella*. Raw or undercooked eggs should be avoided unless pasteurized eggs have been used in place of eggs with shells. Commercial products (as opposed to home-made) containing raw eggs i.e. mayonnaise, salad dressing, custards, and ice cream are all made with pasteurized eggs
- Raw fish and shellfish: associated pathogens are *noroviruses, vibrionaceae, salmonella* as well as some *helminthic* and *protozoan* species. Shellfish account for more infections than finfish. Seafood marked for human consumption is inspected for microbial contamination. While cooking is the most effective way of inactivating parasites, flash freezing is also effective and used most often on sushi grade fish. Raw fish from a reputable place, consumed soon after purchase is safe
- Fish Consumption in pregnancy
    - Health Canada recommends eating at least 150 grams (5 ounces) of cooked fish each week in pregnancy, with preference for Low Contaminant Fish (i.e. low mercury and high fatty acids)
        - Includes anchovy, capelin, char, hake, herring, Atlantic mackerel, mullet, Pollock, salmon, smelt, rainbow trout, lake whitefish, blue crab, shrimp, clam, mussel, and oyster
    - Limit 75 g per month (approximately 1/2 cup) of high mercury fish, which includes fresh/frozen tuna, shark, swordfish, marlin, orange roughy, and escolar
    - Canned Tuna
        - Canned Albacore (white) Tuna should be limited to 2.5 cans per month
        - Canned Light Tuna should be limited to 2.5 cans per week

[2]Exercise

In uncomplicated pregnancies, women should be encouraged to participate in aerobic and strength-conditioning exercises regardless of previous level of physical activity. New evidence suggests better engagement in exercise if begun early or prior to pregnancy. If not previously started, exercising should be re-emphasized in the 2nd

trimester when symptoms such as nausea, vomiting, and fatigue diminish and prior to the physical limitations of the 3rd trimester.

Recent evidence, focusing on both aerobic and strength-conditioning exercise regimens in pregnancy, has shown that benefits of exercise include fewer newborn complications, a reduced number of C-sections or instrumental deliveries, and a decreased incidence of urinary incontinence, excessive weight gain, and depression. There has be no evidence to suggest increases in early pregnancy loss, late pregnancy complications, abnormal fetal growth, or adverse neonatal outcomes. The absence of exercise is associated with risks, including loss of muscular and cardiovascular fitness, excessive maternal weight gain, higher risk of GDM or GHTN, development of varicose veins and DVT, higher incidence of physical complaints such as dyspnea or lower back pain, and poor psychological adjustment to the physical changes of pregnancy.

The Physical Activity Readiness Medical Examination for Pregnancy (PARmed-X for Pregnancy) is an endorsed tool for screening and guiding women interested in exercising through pregnancy. Women who have been exercising prior to pregnancy may continue their exercise regimen based on the PARmed-X guidelines. Sedentary women should be encouraged to start with 15 minutes 3 times weekly and gradually increase to 30 minutes 4 times per week.

Contraindications to exercise in pregnancy

Absolute Contraindications	Relative Contraindications
• Ruptured membranes • Preterm labour • Hypertensive disorders of pregnancy • Incompetent cervix • Growth restricted fetus • High order multiple gestation (triplets) • Placenta previa after 28th week • Persistent 2nd or 3rd trimester bleeding • Uncontrolled type 1 diabetes, thyroid disease, or other serious cardiovascular, respiratory, or systemic disorder	• Previous spontaneous abortion • Previous preterm birth • Mild/moderate cardiovascular disorder • Mild/moderate respiratory disorder • Anemia (Hb <100 g/L) • Malnutrition or eating disorder • Twin pregnancy after 28th week • Other significant medical condition

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The safety of exercise has only been evaluated up to moderate levels of intensity. You may refer to PARmedX for heart rate target zones. Alternatively, advise women to use the "talk test," for which they should be able to maintain a conversation during exercise and should reduce the intensity if this is not possible.

Women should avoid exercises that can cause loss of balance (i.e. horseback riding, bike riding, ice hockey, etc.) as well as scuba diving (fetus is not protected from decompression sickness/air embolism).

Advise women to stop exercising and seek medical advice if they experience any symptom listed below:

- Excessive shortness of breath
- Chest pain
- Presyncope
- Vaginal bleeding
- Painful contractions
- Leakage of amniotic fluid

Please refer to the PARmed-X for Pregnancy tool for additional information at:
http://www.csep.ca/en/publications/get-active-questionnaire

[3] Smoking, Alcohol, Cannabis, Drugs, and Caffeine

All women should be appropriately counselled about the risks of periconception, antepartum, and postpartum substance use. It is critical to establish rapport with substance-using women through a non-judgemental approach and flexibility in providing ongoing prenatal care and support.

Smoking is associated with spontaneous abortion, preterm labour, premature rupture of membrane, placenta previa, placental abruption, intrauterine growth restriction, and low birthweight. It puts the neonate at increased risk of SIDS and perinatal mortality. Longterm effects on the child include childhood asthma, behavioural problems, and ADHD. Psychosocial interventions are considered first-line for quitting, followed by nicotine replacement and/or pharmacotherapy.

Alcohol consumption has been directly linked to fetal alcohol spectrum disorder, which includes growth restriction, facial dysmorphology, CNS dysfunction, and brain damage. The risk increases with alcohol consumption, but there is *no safe level for maternal drinking*. Recent evidence from Sweden revealed subtle longterm cognitive and behavioural effects even with low-dose alcohol consumption.

Cannabis has had inconsistent effects on pregnancy but may have longterm cognitive and behavioural consequences for exposed children. Risks of use include preterm labour, low birthweight, lower IQ scores, and ADHD. THC appears to be involved as it crosses the placenta into fetal tissue and can accumulate in breastmilk.

Other drugs, including opioids, cocaine, and hallucinogens vary in their effect on the pregnancy and neonatal outcomes. There is strong evidence supporting opioid agonist treatment with methadone or buprenorphine for opioid use disorders.

Caffeine has not been subtantiated as a cause of birth defects. Nonetheless, Health Canada recommends limiting caffeine to 300 mg of caffeine daily (approximately 500 mL drip coffee or 1.2 L strong tea). Increased caffeine consumption may be associated with increased spontaneous abortion rates. Herbal teas may be safe in pregnancy depending on ingredients and amount (ginger balm, orange peel, rose hip, citrus peel and linden flower are considered safe).

[4] Prescription Medications

Almost any drug that exerts a systemic effect in the mother will cross the placenta and reach the fetus. For any drug used in pregnancy, the advantages must clearly outweigh the risks to the fetus. Prior to conception, all medications should be reviewed and discontinuation or safer alternatives considered. For information on safety of specific medications in pregnancy, see Drugs in Pregnancy and Lactation or visit Motherisk at www.motherrisk.org.

All expectant mothers should speak to a physician or pharmacist before taking OTC medications.

[5] Congenital Anomalies and Hereditary Disorders

Screening for the heterozygous or carrier state is recommended for individuals belonging to populations known to have an increased carrier frequency for genetic disorders. If there are concerns for specific genetic disorders, contact your community's genetic clinic.

1. Tay-Sachs (1 in 29 Ashkenazi Jews, some French Canadians are carriers. Test ANY individual with even a mixed background involving Ashkenazi Jewish)
    - Autosomal recessive, progressive neurodegenerative disorder, starts at 3-6 months of age

- Caused by deficiency of enzyme hexosaminidase-A, which breaks down a fatty waste substance found in brain cells, thereby causing toxic accumulation in the brain
- Testing detects approximately 95% of Ashkenazi Jewish carriers and 30% of other carriers
- "Ashkenazi screen" (includes Tay-Sachs, Canavan, familial dysautonomia, Bloom syndrome, Fanconi Anemia type C, Mucolipidosis type IV, Niemann Pick disease type A & B) can be done through HSC (patients can call (416) 813-5799 to make appointment).

2. Familial Dysautonomia (1 in 30 Ashkenazi Jews are carriers)
    - Autosomal recessive, progressive neurodegenerative disorder
    - Caused by mutation in the IKBKAP gene on chromosome 9
    - Testing detects approximately 99% of Ashkenazi Jewish carriers
3. Canavan Disease (1 in 57 Ashkenazi Jews are carriers)
    - Autosomal recessive, progressive neurodegenerative disorder, starts at 3-6 months of age
    - Caused by deficiency of enzyme aspartoacylase, which breaks down N-acetylaspartic acid in brain tissue, thereby causing toxic accumulation in the brain
    - Testing detects approximately 99% of Ashkenazi Jewish carriers and 50-55% of other carriers
4. Other "Ashkenazi panel" diseases (in addition to above 3)
    - Bloom Syndrome (1 in 102), Fanconi Anemia Group C (1 in 89), Mucolipidosis IV (1 in 100), Niemann Pick Disease type A & B (1 in 90)
5. Thalassemia α and β (prevalent in Asian, Black, Hispanic, Mediterranean, Middle East people)
    - Hb electrophoresis if MCV < 80
        - $\uparrow$ Hb A_2 or Hb F levels indicative of β-thalassemia carrier state
        - Presence of Hb H inclusion bodies in RBCs indicates α-thalassemia carrier state (may have normal electrophoresis)
        - *Consider ordering Hb electrophoresis with initial blood work if suspicious*
6. Sickle Cell Disease (1 in 12 Blacks, also found in Indian, Mediterranean, Asian, Middle Eastern)
    - Check for MCV and sickle cell trait in ***both*** parents
7. Cystic Fibrosis (1 in 20 Caucasians)
    - Refer to Genetics if any family history

[6] Rubella and Varicella

Maternal infection with rubella until 20 weeks GA can cause congenital rubella syndrome (cataracts, deafness, hepatosplenomegaly, congenital heart disease, mental retardation, hematologic changes, IUGR, and death). All women of childbearing age should have their rubella immunity determined. The majority will be immune as a result of childhood immunization. If a pregnant woman lacks antibodies, she should be advised of the risk and encouraged to avoid exposure and immunize postpartum.

Varicella infection in pregnancy, especially during the first half, can lead to congenital varicella syndrome (low birth weight, skin scarring, ophthalmic abnormalities, limb hypoplasia, cortical atrophy, etc.). All women without a definite history of prior chickenpox or Varicella vaccine should be tested for varicella immunity. If a pregnant woman is not immune, she should be advised of the risk and encouraged to avoid exposure. In case of significant exposure, administration of varicella-zoster immunoglobulin (VZIG) will usually prevent infection if given within 96 hours of exposure.

If a non-pregnant woman lacks antibodies to rubella, she should be immunized with the live attenuated vaccine (MMR) and advised to defer pregnancy for 1 month afterwards (note that the risk to the fetus is small, and accidental conception is not an indication for termination). If a non-pregnant woman lacks antibodies to varicella, she should be vaccinated with Varivax (2 doses, 4-8 weeks apart) and advised to defer pregnancy for 1 month after the 2nd vaccination.

[7] HIV

HIV is transmitted from an infected mother to her fetus in 20-30% of cases via vertical and perinatal transmission. The transmission rate can be reduced to 1-2% with maternal use of anti-retrovirals during pregnancy. Therefore, HIV testing should be offered to all pregnant women and encouraged when risk factors are present. Women who engage in high risk behaviour should be offered testing each trimester. Women who test positive should be referred to a practitioner experienced in treating HIV-positive women.

[8] Folic Acid Supplementation

All reproductive-aged women should be advised about the benefits of folic aid supplementation whether or not pregnancy is contemplated due to the high rate of unplanned pregnancy. Supplementation prior to conception and in early pregnancy has been associated with prevention of neural tube defects and other congenital anomalies, including heart defects, uterine tract anomalies, oral facial clefts, limb defects, and pyloric stenosis.

Neural tube defects (NTDs) occur in Canada at a rate of approximately 1-2 per 1,000 births. Folic acid reduces the recurrence risk with 1 previously affected child from 2-5% by over 70%. In low risk pregnancies folic acid reduces NTDs by 50-70%.

Supplementation should begin 2-3 months prior to conception and continue throughout pregnancy and postpartum period. Recommended daily folic acid supplementation varies based on risk in the first trimester, but all women should take 0.4-1 mg folic acid daily after 12 weeks gestation until 6 weeks postpartum or completion of breastfeeding.

Women at low risk should supplement 0.4 mg daily throughout the pregnancy.

Women at medium risk should supplement 1 mg daily until 12 weeks. Medium risk includes:

- Personal or FHx of folate-sensitive congenital anomalies
- Family history of NTD in 1st or 2nd degree relative
- Maternal diabetes
- Teratogenic medications with secondary fetal teratogenic effects by folate inhibition (ex: anticonvulsants)
- Maternal GI malabsorption conditions (ex: Crohn's, Celiac, gastric bypass, dialysis)

Women at high risk should supplement 4 mg daily until 12 weeks. High risk includes:

- Women or male partner with personal NTD
- History or a previous neural tube pregnancy

Risks of folic acid supplementation are minimal, but include:

- Allergic reaction (rare) – erythema, rash, pruritus, general malaise, bronchospasm
- Seizure disorders – convulsions may occur in previously controlled patients
- Neoplasia – possible association with neoplasia or exacerbation of pre-existing colorectal cancer

[9] Maternal Age ≥ 40

Age over 40 confers additional risk of complications, including:

- Spontaneous abortion
- Placenta previa
- Gestational diabetes mellitus
- Pre-eclampsia
- C-section
- Preterm delivery
- IUGR/low birthweight
- Stillbirth
- Congenital anomalies – any aneuploidy, but especially an additional X chromosome or trisomy 13, 18, 21

Women in this age group have access to NIPT covered by OHIP. Amniocentesis should not be offered on the basis of age alone. Another special management considerations is induction by 40 weeks, as women in this age group are considered biologically post-term at 39 weeks.

[10] Prenatal Screening

Overall, 97% of babies are born healthy. The remaining are born with some type of abnormalities, ranging from minor to major. Increasing maternal age confers additional risk, but is not the sole contributor. As such, prenatal genetic screening should be offered to all pregnant women, regardless of age.

Multiple screening options are available in Canada and vary based on geographic limitations. In Toronto, the most common screening tests include eFTS, MSS, NIPT, amniocentesis, and CVS.

	eFTS	NIPT	MSS
Test Components	Blood test + NT ultrasound	Blood test for cell-free DNA	Blood test
GA for Testing	11-13+6 weeks GA	9-10 weeks GA onwards	15-20+6 weeks GA
Detection Rate	85-90%	99%	80%
False Positive Rate	Appx. 3-6%	Under 0.1%	Appx. 5%
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Enhanced first trimester screening (eFTS) can be offered as an alternative to IPS particularly for women who would like an earlier result (at 14 weeks) and hence an earlier amniocentesis or CVS. It is a combined blood test and NT scan done between 11-13+6 weeks. It is available through NYGH and Mount Sinai Hospital. As the test does not include a 2nd trimester AFP, it does not screen for ONTDs. The SOGC considers an anatomic US at 18-20 weeks as an appropriate alternative for ONTD screening.

Maternal serum screening (MSS) should be offered to all pregnant women who present too late for FTS (≥14 weeks). It is available between 15-20+6 weeks and involves maternal serum testing of AFP, hCG, uE3 and DIA.

Non-Invasive Prenatal Testing (NIPT) uses fetal DNA circulating in the maternal circulation to screen for aneuploidy. It offers a 99% detection rate with a 0.1% false positive rate for Trisomy 21, >97% detection rate for Trisomy 18, and >93% detection rate for Trisomy 13. The false positive rate is <0.1%. Positive results are reported as either positive, negative, or suspected. The test has been validated in both high and low risk populations. OHIP covers NIPT for high-risk populations, including women ≥40, those with previously affected fetus with Trisomy 21, and positive IPS/FTS in current pregnancy. All women, however, should be offered the test and can pay out of pocket for it. The base cost is approximately $500, but additional tests for deletion syndromes are available for additional cost (including DiGeorge syndrome, Angelman syndrome, Cri-du-chat syndrome, Prader-Willi syndrome, and 1p36 deletion syndrome).

For the test to be successful, a sufficient fraction of fetal DNA must be extracted from the maternal circulation. The overall probability of a non-interpretable result ranges from 1-8%. Maternal factors that reduce the fetal fraction of DNA include obesity and early gestational age (prior to 10-11 weeks). Women with inconclusive results should be offered a redraw with a 50-60% likelihood of a successful test, but retesting must be balanced with significantly delayed diagnosis. Additionally, unsuccessful tests due to low fetal fraction are in themselves associated with up to 5% risk of aneuploidy; accordingly, these women should be offered an ultrasound and genetic counseling to discuss invasive fetal chromosome investigations.

Currently, multiple companies in Ontario offer private NIPT testing. More information can be found at:

- Panorama® via LifeLabs at https://www.lifelabsgenetics.com/product/non-invasive-prenatal-testing/
- Harmony® via Dynacare at https://www.dynacare.ca/news/harmony-prenatal-test-(nipt).aspx

Women undergoing NIPT should still undergo a nuchal translucency ultrasound. Although the NIPT already screens for aneuploidy, a large NT can indicate other structural problems, including cardiac anomalies.

Invasive prenatal procedures for cytogenetic analysis should be offered with a positive/suspected NIPT result. It should rarely be offered prior to non-invasive screening for aneuploidy. It may be offered if women are at increased risk of fetal aneuploidy due to (1) ultrasound findings, (2) pregnancy was conceived by in vitro fertilization with intracytoplasmic sperm injection, or (3) the woman or her partner has a history of a previous child or fetus with chromosomal abnormality or is a carrier of a chromosome rearrangement that increases the risk of having a fetus with a chromosomal abnormality.

Amniocentesis is a procedure in which amniotic fluid is extracted by US guided needle aspiration. It can be done anytime after 15 weeks and carries an additional risk of miscarriage of 0.01-0.5% (baseline risk of spontaneous abortion in early 2nd trimester is 3%). It can be arranged at:

NYGH Prenatal Diagnosis Program	Phone: (416) 756-6345
Sunnybrook High Risk Obstetrics Program	Phone: (416) 480-5367

Chorionic Villus Sampling (CVS) is a procedure in which a sample of placenta is obtained for analysis. It can be done as early as 10 weeks and carries an additional risk of miscarriage of 1%. Confined placental mosaicism, though rare, may limit the validity of the test results. It can be arranged at:

MSH Prenatal Diagnosis Program	Phone: (416) 586-4523
Sunnybrook High Risk Obstetrics Program	Phone: (416) 480-5367

Both CVS and aminocentesis are now being processed by microarray rather than karyotyping. Chromosome microarray analysis provides higher resolution of detection, and it is able to detect duplications and deletions at 1.5 to 3.5 mb range, rather than larger scale changes. Additionally turn around time is usually <2 weeks in comparison to 2-3 weeks with karyotyping. FISH analysis for positive eFTS results is available to look for trisomies with results available within 48 hours. Microarray testing can potentially lead to diagnosis of additions and deletions of unknown significance, which presents a challenging ethical issue and may cause anxiety for parents.

In a multiple gestation pregnancy, fetal nuchal translucency in combination with maternal age is an acceptable first trimester screen for aneuploidy. However, NIPT can be offered, as it provides improvement over nuchal translucency and age alone, but it is only covered by OHIP if meets criteria.

Referral to a placenta clinic or consideration of dedicated placental ultrasound:
Following a fetal ultrasound, patients can be referred for consultation and a dedicated placental ultrasound to look at implantation, vessels, and blood flow. Criteria for referral vary by clinic and should be confirmed prior to referral. A referral should be considered if:

Intrapartum Consultation

1. Abnormal FTS/MSS/IPS testing results – confirm thresholds with clinic prior to referral. The referral should include the anatomy scan, genetic counseling information, and amniocentesis results.
2. Background medical risk factors for placental damage, including insulin-dependent diabetes, significant obesity (BMI>35), advanced maternal age (>40), chronic hypertension, previous venous thromboembolism, renal disease, or autoimmune disease
3. Previous complex obstetrical history suggesting placental damage. These include prior unexplained/placental loss >16 weeks, stillbirth >20 weeks, delivery <34 weeks due to hypertension/preeclampsia/HELLP syndrome, or intrauterine growth restriction (IUGR) due to placental disease

4. Suspected invasive placenta (placenta accreta/percreta) – should be suspicious if have anterior low or previa identified in a patient with previous Caesarean deliveries, myomectomy, multiple D&C's, other uterine surgeries
5. Current pregnancy complicated by hypertension or IUGR
6. Sonographic abnormalities of the placenta and/or membranes
7. Placental/chorionicity/growth problems in multi-fetal pregnancies

Pre-Pregnancy Consultation

1. Multiple risk factors for placental insufficiency
2. Previous pregnancy complicated by stillbirth/severe preeclampsia, HELLP syndrome, IUGR due to placental insufficiency
3. High risk for invasive placenta (≥3 prior C-sections or multiple other risk factors)

Given the long wait times to the placenta clinic (up to 4 months), referrals for pre-pregnancy consultation may be diverted to pre-pregnancy counselling clinics.

[11] Risk of Infections

Influenza is not teratogenic but confers an increased risk of hospitalization and serious complications in pregnancy. All women with suspected or documented influenza infection, regardless of immunization history, should be treated with oseltamivir 75 mg po bid x 5 days.

Toxoplasmosis is a protozoal infection transmitted primarily by eating raw meat or through contact with cat feces. Approximately 30% of women acquire protective anti-toxoplasma IgG antibody (serum test available) before pregnancy, thereby preventing transmission to the fetus. As the symptoms of acute infection are non-specific influenza-like, identification and subsequent treatment are challenging. Less than 10% of newborns with congenital toxoplasmosis have signs at birth (↓ BW, hepatosplenomegaly, icterus, anemia, CNS problems, chorioretinal disease). Pregnant women should be advised to avoid contact with cat feces or eating raw meat.

Human parvovirus B19 is commonly associated with "fifth disease" or erythema infectiosum in childhood. Infection any time during pregnancy may result in spontaneous abortion, fetal anemia, cardiac failure, non-immune hydrops, or fetal death (9%). Approximately 60% of adults are immune. Daycare workers and teachers are particularly at risk of exposure. Pregnant women exposed to parvovirus, regardless of gestation, need to have their immunity established.

Cytomegalovirus (CMV) is the most common congenital viral infection, affecting 0.3-14 per 1,000 live births. Day care centres are a common source of infection, and maternal immunity (50-80%) does *not* prevent recurrence or congenital infection. Most maternal infections are asymptomatic, but 15% have a mono-like syndrome. Affected infants may have ↓ BW, hepatosplenomegaly, hemolytic anemia, and a variety of neurologic complications.

Herpes Simplex Virus (HSV) genital infections have increased prevalance in Canada. Neonatal HSV refers to the peripartum acquisition of the virus from the maternal genital tract. Congenital HSV infection is distinct from neonatal HSV referring to the acquisition of HSV in utero. The manifestations of disease are classified into three levels of disease:

- Skin, eye, and mouth infection
- Central nervous system disease (encephalitis)
- Disseminated disease (90% mortality if untreated)

Congential disease may also be manifested by microcephaly, hepatosplenomegaly, IUGR, and intra-uterine fetal demise.

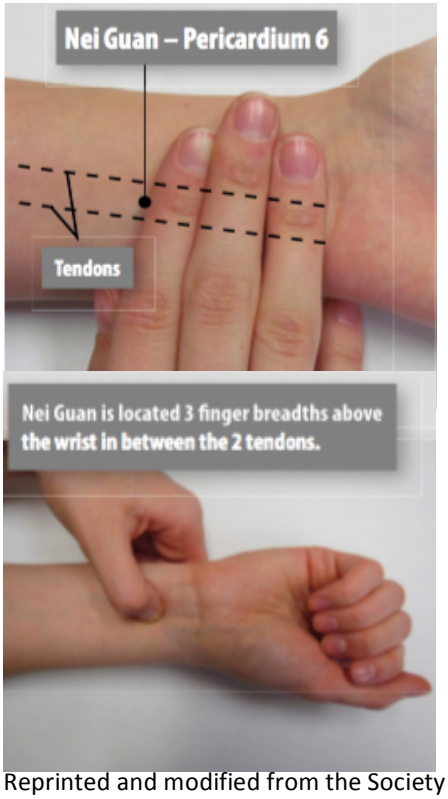
Women should be counselled on increased risk of spontaneous abortion, IUGR, and premature labour with a primary infection. The risk of transferring the virus is 2-5% with clinically-apparent lesions at time of delivery, though asymptomatic shedding is unpredictable and poses a transfer risk of 0.02-0.05%. Women with known disease should undergo HSV prophylaxis, which is discussed later in this document.

[12] Nausea and Vomiting of Pregnancy

Nausea and vomiting of pregnancy (NVP) affects up to 80% of women and can significantly impact quality of life. It is typically most severe in the 1st trimester. Hyperemesis gravidum is an extreme form of NVP and affects up to 2% of pregnancies. It carries risk of low birthweight, preterm labour, SGA, and lower APGAR scores.

Non-pharmacological management is listed below (evidence grade is listed in parentheses):

1. Dietary changes (grade III) – separating solids and liquids; eating small, frequent meals of bland foods; avoiding fatty foods; avoiding drinking cold, tart, or sweet beverages; avoiding sensory stimuli such as strong odours
   - Advise women to eat whatever pregnancy-safe food appeals to them
2. Discontinuing iron supplementation (grade II) – iron requirements do not rise until 2nd trimester
   - Advise substituting iron-containing prenatal vitamins with folic acid or vitamins low in iron
3. Increasing rest (grade III) – fatigue can exacerbate NVP and sleep requirements increase in early pregnancy
   - Recommend increased rest and leave-of-absence from work (with ultimate goal of shortening number of days lost from work)
4. Ginger (grade I) – improves gastric motility through dopamine and serotonin antagonism (250 mg po qid)
5. P6 acupressure (grade I) – apply pressure to P6 acupoint (3 finger breadths proximal to wrist between tendons of palmaris longus and flexor carpi radialis muscles). Acupressure wrist bands are available, offering a convenient method to apply consistent pressure to the area.
6. Psychotherapy (grade I) – mindfulness-based cognitive therapy may be beneficial as an adjunct



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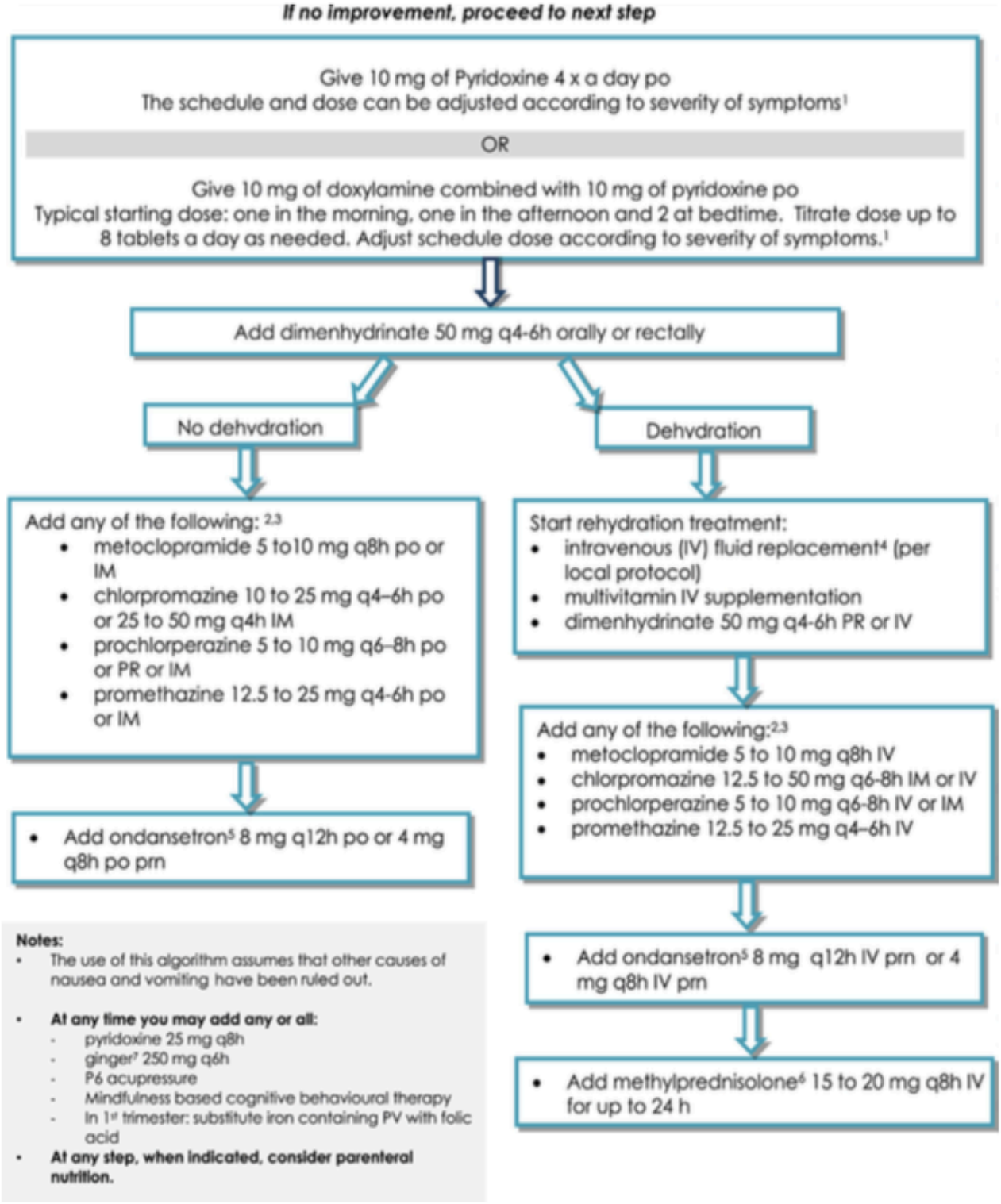
Pharmacological therapy should be offered as soon as possible after the diagnosis of NVP and includes:

- Diclectin® (10 mg doxylamine succinate and 10 mg pyridoxine HCl combined) is a delayed-release combination of vitamin B6 and H1 receptor antagonist, which typically takes effect 4-6 hours after intake
  - Classically prescribed as 2 tabs PO qhs (to prevent morning nausea), 1 tab qAM, 1 tab qPM (daily max: 8 tabs)
- Dimenhydrinate 50 mg q4-6h PO/PR
- Metoclopramide 5-10 mg q8h PO/IM
- Chlorpromazine 10-25 mg q4-6h PO or 25-50 mg q4h IM
- Prochlorperazine 5-10 mg q6-8h PO/PR/IM
- Promethazine 12.5-25 mg q4-6h PO/IM
- Last line: ondansetron 8 mg q12h or 4 mg q8h PO

- Safety of ondansetron is controversial – may be associated with increased risk of birth defects, particularly cleft palate and cardiac anomalies. Must be balanced against risks of NVP.

The following algorithm is offered by the SOGC for the management of nausea and vomiting in pregnancy:



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When nausea and vomiting is refractory to initial pharmacotherapy, proceed with investigation for other potential causes or exacerbating factors, including GI, GU, CNS, and toxic/metabolic problems. Investigation may include electrolytes, TSH, creatinine, LFTs, drug levels, ultrasound, and H. pylori testing.

[13] Low Dose ASA

Low dose ASA is used as a prophylactic treatment for patients at risk for preeclampsia and IUGR. It has been shown to reduce the risk of preeclampsia and IUGR by 50%. Women with the following indications should begin ASA 81 mg po daily at 12-16 weeks until 36 weeks:

- Previous history of placental insufficiency syndromes (ex: IUGR, preeclampsia)
- Certain inflammatory conditions, including antiphospholipid syndrome
- Women with 2 or more of the following risk factors:
    - Pregestational hypertension
    - Obesity
    - Maternal age >40
    - Use of artificial reproductive technology in current pregnancy
    - Pregestational diabetes
    - Multiple gestation
    - Previous history of placental abruption or infarction

The risk for preeclampsia can be calculated using the validated Preeclampsia Risk Calculator, available at: https://fetalmedicine.org/research/assess/preeclampsia

[14] Dating Ultrasound

The SOGC Guideline on Determination of Gestational Age (2014) recommends dating ultrasounds in first trimester even with certain LMP dates. As most patients undergo an NT scan at 11-13+6 weeks, this scan may be used for dating as well. Ultrasound in the first and second trimesters (≤23 weeks) is more accurate than a "certain" menstrual date for determining gestation age in spontaneous conceptions and is the best method for estimating the delivery date. As such, dating should follow ultrasound results once they become available.

There have been no proven adverse biological effects associated with obstetrical ultrasound. The potential adverse effect of tissue heating from energy absorption of the ultrasound beam is managed by routine techniques that maintain a sufficiently low thermal index level.

[15] First Trimester Bloodwork

Ferritin should be measured in 1st trimester and again at 24-28 weeks. A substantial proportion of women in pregnancy are iron deficient without having microcytic anemia. Replacing iron decreases risk of transfusion peripartum and the associated 8% risk of alloimmunization with each transfused unit. Iron deficiency in pregnancy is defined as ferritin <70. Any oral iron supplement is effective. If the patient cannot tolerate oral iron, patients with ferritin <50 and Hb <105 should receive IV Venofer.

TSH should be measured in 1st trimester with repeat testing if abnormal or symptomatic. Normal TSH range in pregnancy drops to 0.1-4.0 as ß-hCG mimics TSH on titres. Untreated maternal hypothyroidism increases complications including premature birth, low birthweight, pregnancy loss, and lower offspring IQ.

- TSH >4.0 = hypothyroidism, and should always be treated
- TSH 2.5-4.0 = sublinical hypothyroidism and should be treated only if anti-TPO AB positive. Accordingly, subsequent anti-TPO AB testing should be performed to guide treatment decision.
- Treatment mainstay is levothyroxine, targetting TSH between 0.1-2.5

    - A dose of only 25-50 mcg is typically sufficient for effective of mild hypothyroidism
- Hypothyroid women should have their TSH monitored q4w until midgestation and at least once near 30 weeks gestation
- Euthyroid women who are known to be anti-TPO AB or anti-Tg AB positive should have TSH tested at time of pregnancy and q4w until midgestation
- Non-pregnant women with hypothyroidism should increase their levothyroxine by 20-30% immediately if suspected or confirmed pregnant (can be accomplished by taking two additional tablets weekly in addition to current daily levothyroxine dosage)
- Hyperthyroidism should be confirmed with T4 and T3, as ß-hCG suppresses TSH levels. If true hyperthyroidism, proceed with antibody testing and referral for management.

Hb electrophoresis should be ordered on patients with MCV <80 or if Black, Indian, Mediterranean, Asian, or Middle Eastern.

Syphilis, caused by *Treponema pallidum,* can cross the placenta and cause congenital syphilis (hepatosplenomegaly, osteochondritis, CNS problems), stillbirth, or neonatal death.

Hepatitis B surface antibody should be tested in all pregnant women. If positive, proceed with further testing including HBeAg, HBV DNA, ALT, and ultrasound. Neonates born to positive mothers should be vaccinated for hepatitis B and given hepatitis B immunoglobulin within the first 12 hours of life. Repeat doses of vaccine are given at both 1 and 6 months of age.

[16] Gonorrhea, Chlamydia, and Asymptomatic Bacteriuria

Gonorrhea has been associated with increased risk of PROM, intra-amniotic infection, perinatal mortality, and neonatal conjunctivitis. It should be treated with azithromycin 1 g po x 1 in addition to ceftriaxone 250 mg IM x 1 or cefixime 800 mg po x 1. If positive during pregnancy, perform a test of cure and repeat testing in the 3rd trimester.

Chlamydia can be tramsmited to the neonate during birth. If positive, it should be treated with azithromycin 1 g po x 1 or amoxicillin 500 mg po tid x 7 days. If positive during pregnancy, perform a test of cure and repeat testing in the 3rd trimester.

Asymptomatic bacteriuria in pregnancy has been associated with increased risk of pyelonephritis, low birth weight, and preterm birth. Antibiotic treatment has been shown to reduce the risks of pyelonephritis and low birth weight, but not preterm birth. All positive cultures with >100,000 CFU/mL should be treated with appropriate antibiotics. All women with GBS bacteriuria in the current pregnancy are considered colonized at the time of labour and should receive prophylactic antibiotics.

[17] Pregestational or Early Gestational Diabetes Mellitus

The incidence of gestational and pregestational diabetes (GDM and PGDM) has been rising over the past two decades. Women with GDM are at increased risk of maternal, peripartum, and neonatal complications, including shoulder dystocia, C-section, large for gestational age, prematurity, Erb's palsy, and major malformations.

Universal screening occurs at 24-28 weeks and will be discussed later in this document. In women at high risk of GDM based on multiple risk factors, earlier screening in the 1st trimester should take place. Risk factors include:

- Previous diagnosis of GDM
- Prediabetes
- Member of a high-risk population (Aboriginal, Hispanic, South Asian, Asian, African)

- Age >35
- BMI >30kg/m^2
- PCOS
- Acanthosis nigricans
- Corticosteroid use
- History of macrosomic infant
- Current fetal macrosomia or polyhydramnios

In the 2018 guidelines, the Canadian Diabetes Association makes the following recommendation for testing glucose levels in early pregnancy:

- A1c should be tested with the first trimester bloodwork in pregnant women with any risk factor
    - If the patient has anemia or hemoglobinopathy, a FPG should be done instead
- Cutoffs for diagnosis of diabetes remain unchanged: FPG ≥7.1 or A1c ≥6.5%
- All women diagnosed with GDM should be referred to a multi-disciplinary diabetes pregnancy program, if available
- A FPG of 5.1-7.0 or A1c of 5.7-6.4% confer significant risk of GDM later in pregnancy and should prompt referral to a dietician
    - Consult your local hospital regarding available resources
        - Sunnybrook offers dieticians through W&B Diabetes in Pregnancy Clinic

Women with GDM should also be screened for T2DM with a 75g OGTT between 6 weeks and 6 months postpartum.

[18] Flu Vaccine

The inactivated influenza vaccine should be offered to all pregnant women during the influenza season. It offers protection to the patient and reduces proven influenza infections in infants under 6 months of age by over 60%.

Note on other vaccines: toxoids and inactivated viral and bacterial vaccines can be safely used in pregnancy and while breastfeeding. Live vaccines (ex: MMR, Varicella) should not be administered during pregnancy due to theoretical risk to the fetus. If it is inadvertently given during pregnancy, women should not be counselled to terminate the pregnancy due to teratogenic risk. These vaccines may be given to breastfeeding women.

[19] Trial of Labour after C-section

The success rate of trial of labour after C-section (TOLAC) is approximately 75%. Predictors of successful vaginal birth after C-section include previous vaginal delivery and non-recurring indication for Caesarean birth, such as malpresentation or gestational hypertension. A history of Caesarean birth for dystocia, failure to progress, or cephalopelvic disproportion has been inconsistently associated with lower success rates.

Good candidates include women with one previous low transverse uterine incision. Risks should be discussed reviewed, and include:

- Maternal risks – uterine rupture (0.5%), perinatal mortality (0.13%)
- Baby risks – hypoxic ischemic encephalopathy, hemorrhage, death

Contraindications include:

- Vertical incision
- >1 C-section
- High-risk uterine scars, including from prior uterine rupture

- Past C-section within 18 months
- Placenta previa, breech, etc.
- Lack of appropriate facility (OR must be readily available)

[20] Bacterial Vaginosis

Bacterial vaginosis (BV) is the most common lower genital tract disorder in reproductive-aged women. It is associated with multiple obstetrical complications, including preterm labour, preterm rupture of membranes, spontaneous abortion, intra-amniotic infection, postpartum endometritis, post-surgical wound infections, and subclinical pelvic inflammatory disease.

There is currently no consensus as to whether to screen or treat BV in all pregnant women. Guidelines currently recommend screening high risk women at 12-16 weeks as well as testing symptomatic women. High risk women include those with history of preterm labour or low birth weight. If positive, patients should be treated with metronidazole 500 mg po bid x 7 days or clindamycin 300 mg po bid x 7 days. Topical agents are not recommended despite similar cure rates, as they have not been shown to effectively prevent preterm birth. Test of cure should be done one month after treatment.

[21] Indications to Contact MD

All patients are provided with a list of red flag symptoms that should be reported immediately to an MD. It is prudent to review the following symptoms with patients:

- Vaginal bleeding
- Leaking of fluid from vagina
- Marked change in fetal movements
- Abdominal pain
- Persistent vomiting
- Chills or fever
- Dysuria
- Dimness or blurring of vision
- Severe or continuous headache
- Swelling of face or fingers

[22] Anatomy Ultrasound

The anatomical ultrasound is performed between 18 and 22 weeks. For obese women, the anatomy ultrasound should be scheduled at 20 to 22 weeks. It is used to confirm the number of fetuses, identify location of placenta, screen maternal organs, and detect congenital anomalies and soft markers of aneuploidy. Due dates should not be adjusted if they have been established by an earlier ultrasound.

Anatomical ultrasound reports should include patient demographic information, number of fetuses, indications of life, biometry, fetal anatomy, amniotic fluid amount, description of placenta, and review of maternal anatomy. While a summary of findings and recommendations for further investigations should be included, it is important to review the results and ensure no findings require further follow up. To interpret abnormal results, please refer to the 2005 SOGC guideline entitled “Fetal Soft Markers in Obstetrical Ultrasound.”

[23] Cord Blood Programs

Several Cord Blood Programs offer processing and cryopreservation of stem cells after collection of umbilical cord blood at the time of delivery. Frozen stem cells may be used in the future to treat some childhood cancers and other potentially fatal diseases (ex: lymphoma and leukemia). It does not carry significant risks to mother or baby. There is currently no consensus regarding private cord blood collection and it remains an optional service.

Patients should be advised that certain peripartum considerations may preclude cord blood collection.

Available services include:

- Private storage - service costs money, but cells are kept for donor/family use only. The patient will be given the cord blood kit to take to the hospital with them when they deliver. The approximate cost is $975-$1175 for the first year, and $125 per year thereafter. Companies include:
    1. Insception Biosciences (905) 206-2790 www.insception.com
    2. Progenics (416) 221-1666 www.progenicscryobank.com
    3. Cells for Life (877) 235-1997 www.cellsforlife.com
    4. CReATe (416) 813-4700 www.createcordbank.com
    5. Cord Blood Bank of Canada (905) 943-4933 www.cordbloodbankofcanada.com
    6. Healthcord (877) 714-6361 www.healthcord.com
- Public cord blood bank – no charge, but parents have no rights to banked sample. There are specific situations in which a sample may be redirected to the family (ex: need for a sibling):
    1. Victoria Angel (905) 471-1113 www.cellsforlife.com/victoriaangel/

[24] Prevention of Rh Alloimmunization

Rh alloimmunization by immunoprophylaxis has led to a marked reduction in perinatal death by erythroblastosis fetalis. Anti-D immunoglobulin (RhIg) should be administered to all Rh –ve women at 28 weeks and again within 72 hours of delivery. Two exceptions exist:

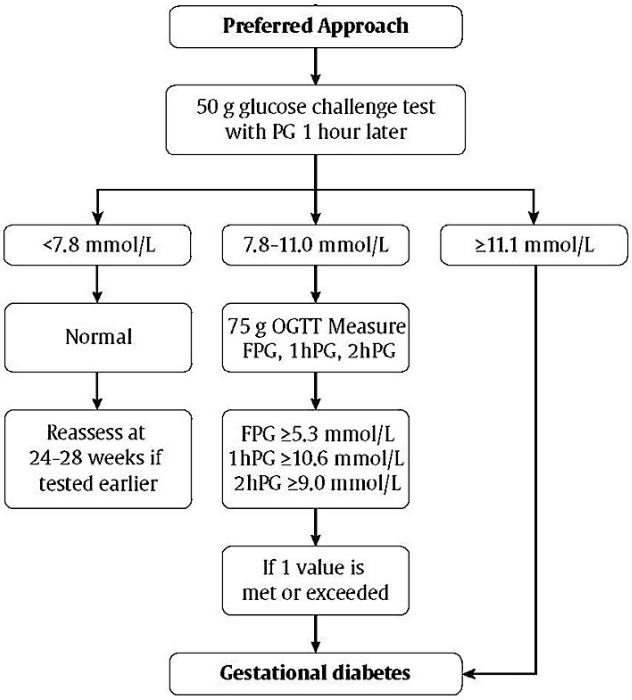
- Women who have pre-existing anti-D antibodies.
- Father is known and confirmed to be Rh –ve.

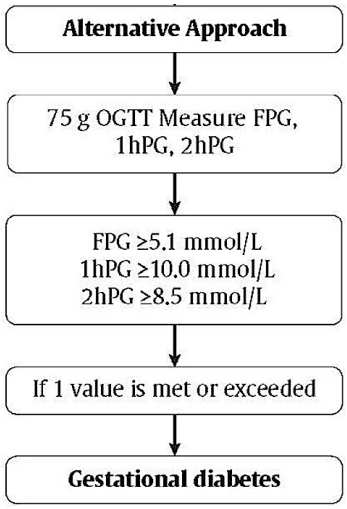
The standard dose of RhIg is 300 µg. Additional doses are required for fetal-maternal hemorrhage greater than 30 mL. Causes of larger hemorrhage include placental abruption, placenta previa with bleeding, blunt trauma to abdomen, and external cephalic version. To determine the exact amount of hemorrhage and the amount of additional RhIg needed, a Betke-Kleihauer acid elution test should be performed. Some facilities will offer flow cytometry testing, which has better sensitivity and specificity.

Other indications for RhIg in Rh –ve women include abortion, ectopic pregnancy, partial molar pregnancy, chorionic villus sampling, amniocentesis, and antepartum bleeding.

[25] Gestational Diabetes Mellitus

As discussed above, GDM confers significant risk to mother and baby. All pregnant women should be screened between 24-28 weeks. The preferred screening method involves a 50 g glucose challenge test (GCT), in which a non-fasting patient drinks a standardized sugar beverage and undergoes a single blood test 1 hour later. For an equivocal result (7.8-11 mmol/L), a 75 g oral glucose tolerance test (OGTT) is perfomed. Glucose levels are measured fasting and at 1 hour and 2 hours after consuming the sugar beverage. Any 1 value above the threshold is diagnostic for GDM. See algorithm for additional information:





Reprinted and modified from the Canadian Diabetes Association (2018)

An alternative approach is screening with a single OGTT (without the preceding GCT). Please note that the diagnostic cutoffs for OGTT differ from the 2-step approach.

All women diagnosed with GDM should be referred to a multi-disciplinary diabetes in pregnancy program, if available. Ongoing surveillance involves frequent self-monitoring of blood glucose, both fasting and postprandial. Glucose targets are:

- Fasting blood sugars <5.3
- 1 hour post-prandial <7.8
- 2 hours post-prandial <6.7

Fetal surveillance for women with confirmed GDM should commence at 28 weeks with a baseline sonographic assessment of fetal growth and amniotic fluid volume. Subsequent assessments should take place every 2-4 weeks. At 36 weeks, medically managed women with GDM should undergo weekly fetal well-being assessments (NST or BPP) until delivery. It is also appropriate to monitor diet-controlled patients.

Pregnant women with GDM or PGDM should be offered induction between 38-40 weeks, depending on glycemic control and other comorbidities. Intrapartum glucose monitoring should continue every 2 hours, targeting plasma levels of 4-7 mmol/L.

All women with GDM should be screened for T2DM with a 75g OGTT between 6 weeks and 6 months postpartum.

[26] Kick counts

Low risk women should be taught how to kick count, should they perceive a decrease in fetal movements. Kick counts involves lying still for 2 hours with cold juice and without external stimulation. Women should perceive 6 movements in 2 hours and can stop as soon as they count 6. If they have less than 6 distinct movements in 2 hours, they should be assessed in triage with an NST and undergo a BPP within 24 hours.

[27] Tdap Vaccine

The tetanus, diptheria, and acellular pertusis vaccine (Adacel) should be offered to all pregnant women ideally between 27-32 weeks during every pregnancy, regardless of vaccination history. The vaccine increases transplacental passage of pertussis antibodies, which confers additional immunity to infants until they receive their 2 month vaccines.

[28] Repeat Ultrasound

At 18 weeks approximately 5% of women have low-lying placenta on ultrasound, but < 0.5% have placenta previa at term. Repeat ultrasound in 3rd trimester is necessary to ensure placenta has migrated and is no longer previa. A placenta >2.0 cm away from the os is considered safe for vaginal delivery, though shorter distances may be considered with OBGYN consultation and an appropriate review of risks to the mom and newborn.

[29] Circumcision

The 2015 Canadian Pediatric Society guideline on circumcision does not recommend routine circumcision for every male newborn. Instead, it recommends each family receive counselling so that the parents can weigh the risks and benefits in the context of their own familial, religious, and cultural beliefs.

Parents who choose to have their sons circumcised should be referred early in the neonatal period to an experienced practitioner. As circumcisions are no longer covered by OHIP, the parents will be required to pay approximately $300-400 for the procedure.

Potential Risks and Benefits of Neonatal Circumcision			
Potential Benefit		**Potential Risk**	
Outcome	**Effect Size**	**Outcome**	**Effect Size**
Prevention of phimosis	NNT = 67	Minor bleeding	1.5%
Decrease in early UTI	NNT = 111-125	Local infection (minor)	NNH = 67
Decrease in UTI in males with risk factors	NNT = 4-6	Severe infection	Extremely rare
Decreased acquisition of HIV	NNT = 298	Death from unrecognized bleeding	Extremely rare
Decreased acquisition of HSV	NNT = 16	Unsatisfactory cosmetic results	
Decreased acquisition of HPV	NNT = 5	Meatal stenosis	<1% when petroleum jelly is used Otherwise NNH = 10-50
Decreased penile cancer risk	NNT = 900-322,000		
Decreased cervical cancer risk in female partners	NNT = 90-140		
Reprinted and modified from the Canadian Pediatric Society			

[30] Group B Streptococci

Group B streptococci (GBS) are common gram positive colonizers, affecting 10-30% of women. It is a major cause of sepsis among newborns. Screening and treatment have been found to reduce morbidity and mortality by 70%. Accordingly, women should be screened for GBS colonization at 35-37 weeks using culture taken from one swab first to the vagina and then to the rectum through the anal sphincter. This recommendation applies to women with planned C-sections as well due to the risk of rupture of membranes before the scheduled date.

Indications for intrapartum IV antibiotic prophylaxis for GBS:

- Positive vaginal/rectal GBS swab at 35-37 weeks
- Preterm premature rupture of membrane or labour unless negative swab documented
- Prolonged rupture of membrane >18 hours unless negative swab documented
- Any woman with an infant previously infected with GBS
- Any woman with documented GBS bacteruria (regardless of CFUs) in the current pregnancy

Should either of the latter two indications be present, a swab is unnecessary as it will not affect management.

Recommended antibiotic regimens for intrapartum prophylaxis include:

- First line: Penicillin G 5 million units IV, then 2.5-3 million units q4h until delivery
- If allergic to penicillin but low risk of anaphylaxis: cefazolin 2 g IV, then 1 g q8h until delivery
- If severe allergy to penicillin: clindamycin 900 mg IV q8h or vancomycin 1 g IV q12h until delivery

For all women with severe penicillin allergies, antibiotic susceptibility testing for GBS should be explicitly requested on the requisition when the swab is done. Regardless of alternate regimen, all neonates not treated with penicillin will require a NICU consult, as they are considered to have had inadequate prophylaxis.

[31] Genital HSV Prophylaxis

Primary infection with HSV1 or HSV2 in the 3rd trimester presents the highest risk to the infant (30-50%) and is an indication for elective C-section. Neonatal cultures for HSV should be performed following delivery.

Recurrent infection carries a 2-5% risk of neonatal infection when HSV lesions are present. To reduce the risk of outbreak and asymptomatic shedding, suppressive antivirals should be started at 36 weeks. If disease is severe, antivirals may be started anytime during pregnancy. The regimens of choice include:

- Acyclovir 400 mg po TID or 200 mg po QID
- Valacyclovir 500 mg po BID

If lesions are present at the time of delivery, C-section is recommended within four hours of rupture of membranes. If no lesions are visible, scalp electrodes and fetal scalp sampling should still be avoided.

[32] Signs of Labour

The onset of labour is defined as regular, painful uterine contractions resulting in progressive cervical effacement and dilatation. Women should be advised to come to triage if:

- Contractions q5min in primip or q10min in multip
- Unable to withstand pain of contractions
- Spontaneous rupture of membrane
    - Within 12 hours if GBS –ve
    - Immediately if GBS +ve or preterm
- Bleeding, decreased fetal movements, etc.

[33] Induction of Labour

Induction of labour is the artificial initiation of labour before its spontaneous onset. Induction is indicated when the risk of continuing the pregnancy for the mother and fetus is greater than the risk associated with an induction.

Induction of labour may be associated with an increased risk of:

- Failure to achieve labour
- C-section
- Operative vaginal delivery
- Tachysystole
- Intra-amniotic infection
- Cord prolapse with artificial rupture of membrane
- Uterine rupture

Considerations for Induction	
Indications	Contraindications
• Preeclampsia ≥37 weeks • Intra-amniotic infection • Suspected fetal compromise • Premature rupture of membranes • Postdates >41 weeks • Diabetes mellitus • Alloimmune disease • IUGR • Oligohydramnios • GHTN ≥ 38 weeks • Logistical problem (ex: distance to hospital) • Intrauterine death in prior pregnancy	• Placenta previa • Vasa previa • Cord presentation • Abnormal fetal lie • Prior classical or inverted T uterine incision • Significant prior uterine surgery • Previous uterine rupture • Active genital herpes • Pelvic structural deformities • Invasive carcinoma in situ
Reprinted and modified from the Society of Obstetrics and Gynecology of Canada	

Several variables will impact the timing and techniques used for induction.

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