Newborn Procedures

In addition to the following procedures, we routinely screen for the following in the early newborn period:

- Hearing screening (done either in hospital or at community Public Health unit)
- Transcutaneous bilirubin monitoring (jaundice testing done in hospital, or blood testing done in a hospital or community lab)
- Critical congenital heart defect screening (done either in hospital or at home with Inlet Birth caregivers)

If you have questions about any of the above procedures, please ask your caregiver.

VITAMIN K PROPHYLAXIS

Vitamin K is essential for the production of blood-clotting factors. Healthy bacteria in the intestinal tract produce Vitamin K. The newborn's intestinal tract is sterile at birth and therefore newborns have low levels of Vitamin K until their intestines are colonized with bacteria to produce it. Newborns, therefore, have lower levels of Vitamin K than adults for the first six weeks. Therefore if bleeding occurs, the newborn's blood can take longer to clot (to stop the bleeding) than an adult's.

While most newborns will not have blood-clotting problems, up to 1.5% will develop Hemorrhagic Disease of the Newborn (HDN), also commonly called Vitamin K Deficiency Bleeding (VKDB). Although rare, HDN can cause serious internal bleeding in the brain or body which can lead to brain damage or death. Prophylactic Vitamin K administration to newborns has been used since the 1950s to decrease the incidence of HDN.
There are three types of HDN:

- *early-onset* occurs in the first 24 hours, may not be prevented by Vitamin K
- *classical* occurs in the first week, protection is provided by Vitamin K
- *late-onset* occurs from 2-12 weeks of age up to 6 months of age, mostly affecting breastfed babies

In BC, Vitamin K is routinely given to all newborns to prevent HDN. A single intramuscular injection into the baby's thigh within a few hours of birth is the most common method. Another (less effective) option is to administer Vitamin K orally. There are no proven adverse effects associated with administration of Vitamin K, by either method, to the newborn.

Incidence of HDN:	
One intramuscular injection of 1.0 mg Vitamin K	1 in 1,439,000
One oral dose of 1.0 – 2.0 mg Vitamin K	1 in 70,000
No Vitamin K administered	1 in 1,700 breastfed infants
No Vitamin K administered	1 in 20,000 artificially fed infants

Parents may choose from the following options:

INTRAMUSCULAR VITAMIN K: This is the most common method to administer Vitamin K as it has been researched the most, and is the most effective. A single injection of 1 mg is administered to a term newborn within several hours of birth; no follow-up doses are necessary. Although the injection is very effective, it can be somewhat painful to the newborn. We mitigate this by trying to do the injection while the baby is comforted at the breast. In the past, there have been queries as to whether injectable Vitamin K was responsible for an increase in childhood cancers, however there has not been evidence supporting these claims. Baby boys who will be circumcised must be protected from bleeding with injectable Vitamin K.

ORAL VITAMIN K: While shown to decrease the incidence of HDN, oral administration is *not as effective* as injectable administration, especially when only administered once. Therefore, a double dose (2 mg) of the intramuscular formulation of Vitamin K is given orally at the time of the first feeding, again at 2-4 weeks, and again at 4-6 weeks of age. The double dose is also used because Vitamin K is less absorbable orally than by injection. It is important to

ensure that all doses are received to provide maximum protection to the newborn. Oral Vitamin K is not the standard of care in British Columbia.

NO VITAMIN K: Without supplemental Vitamin K the incidence of HDN is 1 in 1,700 for breastfed babies, and 1 in 20,000 for formula-fed babies. Formula contains added Vitamin K. There is no evidence showing whether maternal supplementation of Vitamin K through diet or supplements in pregnancy or while breastfeeding affect the incidence of HDN should their babies not receive Vitamin K. While it is impossible to know which babies are at highest risk of HDN, it is believed that those born prematurely, who have visible bruising, or those born via forceps or vacuum deliveries are best protected against HDN by receiving injectable Vitamin K. It is important to understand that *any* newborn who has not received Vitamin K is at risk for HDN. If you have previously chosen not to have Vitamin K administered to your baby and increased risk factors arise, your care provider will discuss this with you at the time of birth if applicable.

EYE PROPHYLAXIS

Approximately 1-12% of all newborns develop conjunctivitis (an infection of the inner lining of the eye) in their first four weeks. Many microorganisms may be responsible for neonatal conjunctivitis including *E. coli*, *haemophilus influenzae*, *staphylococcus aureus*, gonorrhea, or chlamydia. The most serious of these are gonorrhea or chlamydia, which can be passed from the mother to the newborn during the birth process. Either of these can cause permanent blindness in the newborn if untreated.

The position statement published by the Canadian Paediatric Society (CPS) in March 2015, states that the current practice of treating all newborns with prophylactic erythromycin is of questionable efficacy. Instead, CPS recommends that all women be offered screening for gonorrhea and chlamydia during pregnancy, and that those who are positive be treated. Infants of mothers with untreated gonococcal infection at delivery should be treated with the antibiotic ceftriaxone, as it is more effective at treating neonatal conjunctivitis caused by gonorrhea than erythromycin.

As of 2019, health-care providers in BC are no longer required by law (*Health Act Communicable Disease Regulation*) to administer antibiotic ointment to the newborn's eyes within one hour after birth in order to prevent conjunctivitis. However, this procedure is still routinely done in hospital. The topical antibiotic used currently is an ointment containing 0.5% erythromycin. Erythromycin ointment is not painful for the baby, but it will cause brief blurring of the newborn's vision until the ointment is absorbed, and may cause a metallic taste in the mouth.

You may refuse treatment if you do not wish eye prophylaxis for your baby. Should your baby develop increased redness, discharge or swelling in the eye, a culture may be performed to rule out gonorrhea and chlamydia infection as well as to identify other bacteria and determine the proper treatment.

NEWBORN METABOLIC SCREENING FOR RARE BUT TREATABLE DISORDERS

Newborn metabolic screening is done between 24-48 hours after birth. Routine newborn screening identifies infants with rare disorders. In BC, 1 out of every 1,000 babies are found to have one of these rare disorders. Through early detection and treatment, the severe consequences of undiagnosed or untreated disease, including irreversible developmental disability and death, can be avoided. Screening is done by pricking the baby's heel with a lancet and collecting drops of the baby's blood on filter paper for analysis. There are no adverse effects or increased risks associated with newborn screening. However, the newborn may experience pain and/or bruising at the site of the blood draw. Midwives and nurses mitigate discomfort by performing the procedure while the baby is comforted at the breast whenever possible. In BC, the newborn screen currently tests for 24 disorders, including:

Metabolic disorders	Phenylketonuria (PKU), Maple Syrup Urine Disease (MSUD), Citrullinemia (CIT), Argininosuccinic Acidemia (ASA), Homocystinuria (Hcy), Tyrosinemia 1 (Tyr 1), Guanidinoacetate Methyltransferase Deficiency (GAMT), MediumChain Acyl-CoA Dehydrogenase Deficiency (MCAD), Long-Chain HydroxyacylCoA Dehydrogenase Deficiency (LCHAD), Trifunctional Protein Deficiency (TFP), Very-Long chain Acyl-CoA Dehydrogenase Deficiency (VLCAD), Propionic Acidemia (PROP), Methylmalonic Acidemia (MUT), Cobalamin Disorders (Cbl A,B), Glutaric Aciduria Type 1 (GA1), Isovaleric Acidemia (IVA), Carnitine Uptake Disorder (CUD), and Galactosemia (GALT)
Endocrine disorders	Congenital Hypothyroidism (CH) and Congenital Adrenal Hyperplasia (CAH)
Hemoglobinopathies (blood disorders)	Sickle Cell Disease (HbSS), Sickle Cell/Hemoglobin C (HbSC), and Sickle Cell/ β -thalassemia (HbS/ β -thal)
Cystic Fibrosis (CF)	Cystic Fibrosis (CF)

The optimal time frame for completing the Newborn Metabolic Screen (NBS) test is between 24 and 48 hours of age. Timing can be crucial to avoid irreversible damage or death in cases of positive results. If you have questions about any newborn procedure, please speak to one of your care providers.

References

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7. Newborn Screening Program of British Columbia. http://www.newbornscreeningbc.ca
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