Appendix 5

Soft Markers Identified on Detailed Ultrasound

Several markers identified on second-trimester ultrasound examination are associated with increased chance of Down syndrome. The markers are not equally suggestive of Down syndrome. Based on the presence or absence of these markers, positive or negative likelihood ratios can be applied to the calculation of chance of Down syndrome from SIPS/IPS/Quad or maternal age allowing modification of a patient's chance[10]. Some markers are also indicative of increased chance of condition(s) other than Down syndrome.

Markers that significantly increase the chance of Down syndrome include:

- increased nuchal thickness (NTh) ≥ 6 mm
- echogenic bowel (equal or greater than bone)
- ventriculomegaly
- **absent** nasal bone (second trimester) (not routinely looked for)
- aberrant right subclavian artery (not routinely looked for)

Markers with only a small impact on the chance of Down syndrome include:

- echogenic intracardiac focus (EICF)
- pyelectasis (5 mm – 10 mm)
- abnormal femur/foot ratio (≤ 0.9).

Markers that increase the chance of condition(s) other than Down syndrome include:

- increased nuchal thickness (NTh) ≥ 6 mm
- echogenic bowel
- ventriculomegaly
- pyelectasis (5 mm – 10 mm)

Recommended management:

1. If ultrasound detects **absent** nasal bone (second trimester), aberrant right subclavian artery, or more than one marker, consult with or refer to Medical Genetics.

2. If ultrasound detects ventriculomegaly, referral to the Fetal Diagnosis Service (BCWH) or Victoria MFM is recommended.

3. If ultrasound detects increased nuchal thickness:
   - If NTh is between 6 – 7mm and cardiac views are reported as normal and patient had negative NIPS screen, no further testing is recommended.
   - If NTh is between 6 – 7mm and cardiac views are reported as normal and patient had SIPS/IPS/Quad, or no screen, the chance of Down syndrome should be recalculated using the Trisomy21 calculator (www.perinatalservicesbc.ca/health-professionals/professionalresources/screening/prenatal-genetic/trisomy-21-risk-calculator). Medical Genetics can be consulted for help with calculation as needed. If revised chance of Down syndrome is greater than 1 in 300, patient qualifies for amniocentesis or funded NIPS. If patient chooses funded NIPS, contact medical genetics (604-875-2157 BCWH, or 250-727-4461 Victoria) for NIPS code.

- If NTh is between 6–7mm and cardiac views are reported as not well seen, in addition to recalculation of the chance of Down syndrome using the Trisomy21 calculator, a prompt reassessment of the cardiac views is needed. For patients from VCH, NHA, IHA, this can be facilitated through referral to Medical Genetics at BCWH; for patients from FHA, referral to the Jim Pattison Maternal Fetal Medicine Service is recommended; for VIHA patients, referral to Medical Genetics at Victoria General Hospital is recommended.
- If NTh is 7mm or greater, referral to Medical Genetics (Vancouver or Victoria) is recommended.

4. If ultrasound detects echogenic bowel:
   - If associated dilated bowel loops, referral to the Fetal Diagnosis Service (FDS) is recommended.
   - If isolated echogenic bowel as bright as bone:
     - Chance of an intrauterine infection is increased. Recommend serology IgM and IgG for CMV, Toxoplasmosis and Parvovirus.
     - Chance of Down syndrome is increased. If patient had negative NIPS, chance of Down syndrome remains low. If patient had SIPS/IPS/Quad or no screen, the chance of Down syndrome should be recalculated using the Trisomy21 calculator (www.perinatalservicesbc.ca/healthprofessionals/professional-resources/screening/prenatal-genetic/trisomy-21-risk-calculator). Medical Genetics can be consulted for help with calculation as needed. If revised chance of Down syndrome is greater than 1 in 300, patient qualifies for amniocentesis or funded NIPS. If patient chooses funded NIPS, contact medical genetics for NIPS code.
     - Chance of cystic fibrosis is increased for Caucasian couples. Offer CF carrier screening on patient and partner (requisition available at www.genebc.ca). For midwifery patients, this can be facilitated through referral to Medical Genetics.
     - Risk of developing IUGR in third trimester is increased. A follow up ultrasound around 30–32 weeks gestation is recommended.

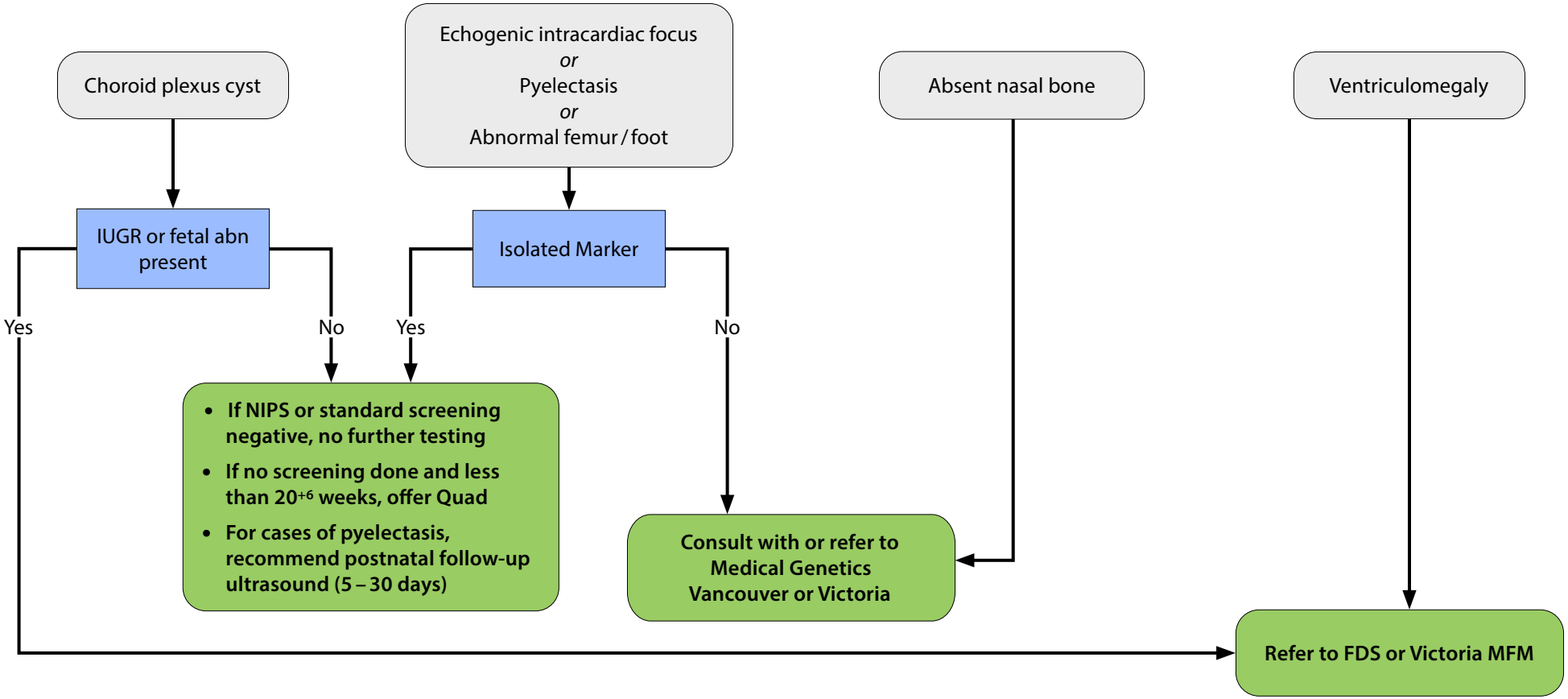
5. If ultrasound detects isolated pyelectasis, abnormal femur/foot ratio (≤0.9) or echogenic intracardiac focus (EICF), and the Down syndrome screen (SIPS /IPS /Quad or NIPS) showed a negative screen (low chance), no further prenatal testing is recommended. If no screening has been done and patient is less than 21 weeks and 6 days gestation, Quad screening should be offered. For patients with an ultrasound finding of pyelectasis, a postnatal renal ultrasound between 5–30 days of age is recommended.

6. If Choroid plexus cyst (CPC) is detected, referral to Medical Genetics is recommended only if CPC is seen in combination with structural abnormalities or growth restriction. No further testing is indicated if CPC is identified in isolation and the patient's SIPS /IPS /Quad or NIPS is screen negative for trisomy 18 (for SIPS/ IPS/Quad, risk only appears on report when screen positive). If no screening has been done and patient is less than 20 weeks and 6 days gestation, Quad screening should be offered.

Medical Genetics		Fetal Diagnosis Service (FDS)	Maternal Fetal Medicine		
Vancouver: T: 604-875-2818 F: 604-875-3484	Victoria: T: 250-727-4461 F: 250-727-4295	T: 604-875-2848 F: 604-875-3484	BC Women's Hospital: T: 604-875-2162 F: 604-875-3255	Surrey Jim Pattison: T: 604-582-4558 ext. 763995 F: 604-582-3798	Victoria General: T: 250-727-4266 F: 250-727-4441

[10] Agathokleous M, Chaveeva P, Poon LCY, Koosinski P, Nicolaides KH. Meta-analysis of second trimester markers for trisomy 21. Ultrasound Obstet Gynecol 2013; 41:247-261.

Soft Markers on 2nd Trimester Ultrasound



NIPS: Non-Invasive Prenatal Screening

Medical Genetics		Fetal Diagnosis Service (FDS)	Maternal Fetal Medicine		
Vancouver: T: 604-875-2818 F: 604-875-3484	Victoria: T: 250-727-4461 F: 250-727-4295	T: 604-875-2848 F: 604-875-3484	BC Women's Hospital: T: 604-875-2162 F: 604-875-3255	Surrey Jim Pattison: T: 604-582-4558 ext. 763995 F: 604-582-3798	Victoria General: T: 250-727-4266 F: 250-727-4441

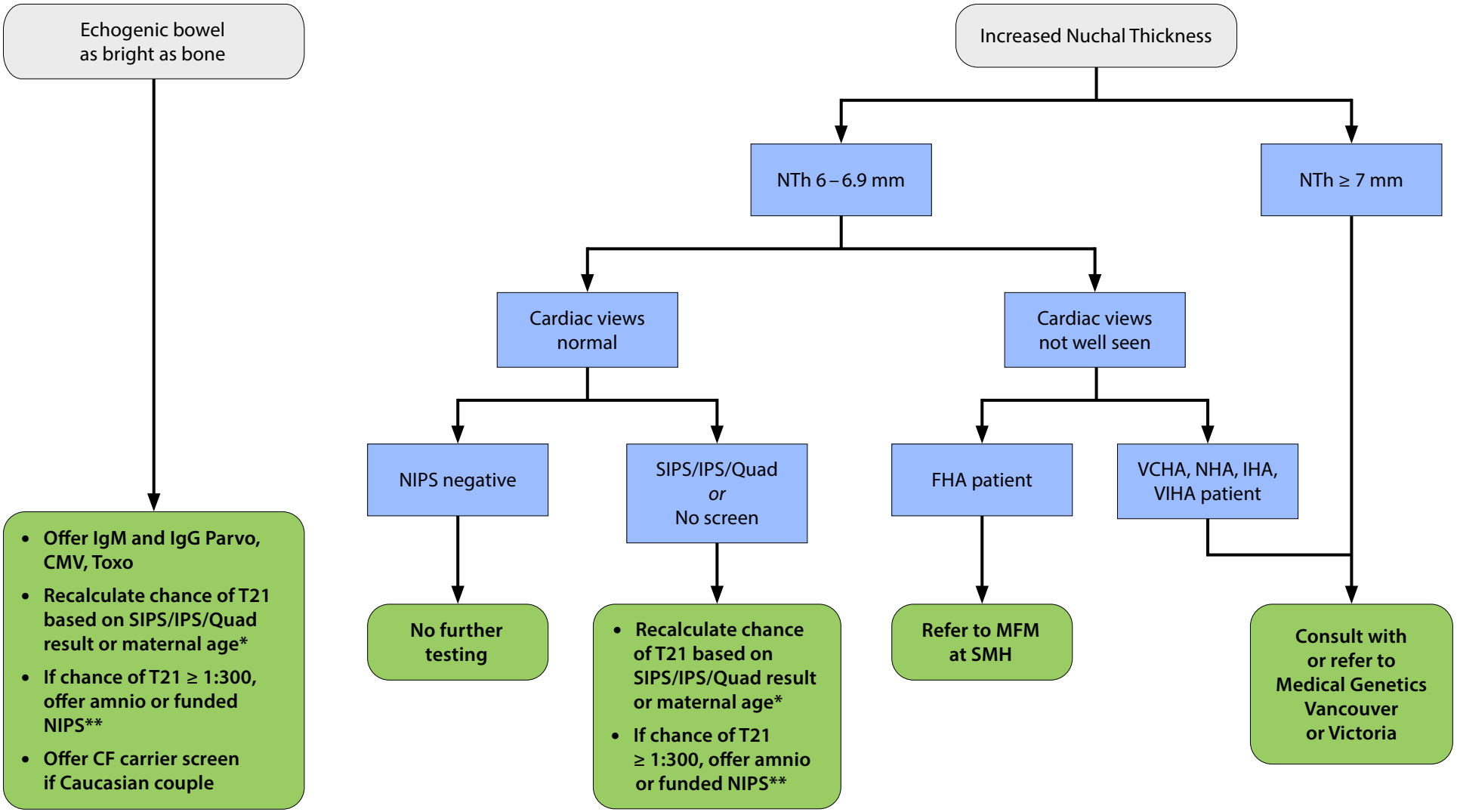
BC Prenatal Genetic Screening Program

Perinatal Services BC
Provincial Health Services Authority

Provincial Health Services Authority

July 2022

Soft Markers on 2nd Trimester Ultrasound



NIPS: Non-Invasive Prenatal Screening

* Use T21 risk calculator on PSBC website or consult medical genetics.

** Contact medical genetics (604-875-2157 BCWH, or 250-727-4461 Victoria) for NIPS code.

BC Prenatal Genetic Screening Program

Perinatal Services BC
Provincial Health Services Authority

Provincial Health Services Authority

July 2022