**TITLE: GENETIC TESTING IN PREGNANCY LOSS and ANOMALIES**

**Subtitle: Genetic testing: SAB, IUFD, Anomalies**

**SUMMARY: Pregnancy loss is one of the most common adverse pregnancy outcomes in all trimesters. Associated genetic abnormalities can be identified easily, may impact the grief process and future reproductive planning, and should be investigated routinely. Similarly, when major fetal anomalies are recognized on ultrasound, the coincidence of genetic differences is high. Chromosomal microarray (CMA) is preferred over karyotype.**

**Rationale:** First trimester loss is recognized in 10% of clinically apparent pregnancies and increases with maternal age and history of prior loss. Approximately half of early losses are due to fetal chromosomal abnormalities. Stillbirth occurs in 1:160 deliveries in the US with almost 24,000 stillbirths at 20 weeks or greater each year. An abnormal karyotype is identified in 5-13% of these infants (approximately 5% when structurally normal and up to 20% when anatomically abnormal or growth restricted) and abnormal CMA in 35-50% regardless of anatomy or growth trajectory. Genetic conditions are identified in a significant proportion of fetuses with major structural differences identified on ultrasound (coincidence varies by anomaly). Every practice should have an algorithm for genetic testing after fetal loss or detection of fetal anomalies. In general, CMA is preferred over karyotype for 2 reasons: (1) its success in nonviable tissue (2) detection of both aneuploidy and smaller deletions and duplications known as copy number variants (CNV).

**Eligible patients:** Patients with pregnancy loss in any trimester, as well as those with major fetal anomalies on ultrasound, who have not had definitive genetic testing (NOT just screening) are candidates for CMA. If additional unexpected findings are encountered, more extensive testing (whole exome or whole genome sequencing) may be considered in some cases where chromosomal microarray has already been performed. Karyotype should be obtained if CMA is not available or in addition to CMA if a parent carries a balanced translocation or has a mosaic karyotype. Consent should be obtained.

**Contraindications:** Patient has already had definitive genetic testing or does not desire genetic information.

**Technique:** Various tissues can be used for CMA as gestational age appropriate and clinically relevant. **A maternal blood draw may also be needed** to assess maternal cell contamination in the fetal specimen. Check with your lab. Acceptable cytogenetic specimens include the following:

-products of conception (spontaneous passage or obtained at D&C)

-amniotic fluid obtained by amniocentesis (increases yield especially if delivery is not imminent or only karyotype is available/desired)

-placental biopsy (transabdominal CVS or placental block after delivery, taken beneath the cord insertion site and including the chorionic plate after cleaning biopsy site with an alcohol swab)

-umbilical cord segment

-fetal tissue (heel tendon, costochondral or patellar tissue)

**\*\*\*Please see related document (MISSION HEALTH GENETIC TESTING) for lab information specific to Mission Health\*\*\***

**Special Considerations:** Karyotype should be obtained if CMA is not available or in addition to CMA if a parent carries a balanced translocation or has a mosaic karyotype. Genetic testing is an adjunct to ultrasound diagnosis, fetal gross examination, autopsy, and placental pathology as indicated by gestational age and clinical situation. Some unique situations may warrant whole exome or whole genome sequencing, technologies likely to become more affordable and available in the future. Discussion with a genetic counselor and/or geneticist may be helpful.

**References:**

Obstetric Care Consensus #10: Management of Stillbirth, ACOG/SMFM, March 2020.

Early Pregnancy Loss, ACOG Practice Bulletin 200, November 2018.

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