WISCONSIN STILLBIRTH SERVICE PROGRAM

CLINICAL PHOTOGRAPHS OF STILLBORNS
Photographs have proven extremely helpful in supplementing [but not supplanting] the clinical examination. The higher the quality of the photographs the more helpful they will be. However, fear of poor quality shouldn't inhibit you -- blurry polaroid snapshots are better than no pictures at all! Digital photos are great and if you wish you may email them to Dr McPherson <mcpherson.elizabeth@marshfieldclinic.org>.
Photographs should include:
1. Whole body frontal photo including limbs (hands palm up if possible);
2. Frontal and lateral pictures of the face;
3. Photos of any abnormal parts.

X-RAY EVALUATION OF STILLBORNS
About 20% of unselected stillborns will have radiographic abnormalities. While x-rays are most critical in dwarfining conditions etc., unexpected positive findings in other infants whom we have previously evaluated suggest that all stillborns should have x-ray studies done.
Because of the number of types of machines used, and the need for individual calibration, we cannot make specific recommendations for technique. Settings appropriate for a living premature infant of comparable size should result in technically adequate films. For very small stillborns, mammography may be more effective.
Positioning and Views to be Taken:
1. Every stillborn should have one AP 'babygram'. The infant should be positioned so that the trunk is as truly AP as possible. The head should be turned to the side (true lateral of the head). The limbs should be straightened as much as possible and, if possible, placed in the 'anatomic' position (resulting in AP views of both the arms and legs). Head and all limbs (including hands and feet) should be included.
2. Stillborns with visible limb abnormalities should have separate films should be taken of the abnormal parts. When short limbs or dwarfism are noted, films should include: AP and lateral of all limbs, AP of the hands, lateral spine

FETAL-MATERNAL HEMORRHAGE TESTING FOR STILLBORN EVALUATION
Massive fetal maternal hemorrhage (FMH) may be the cause of around 1 in every 50 stillbirths. No antecedent historical or clinical features allow sufficient selection, so that with any selectivity a large proportion of FMH will remain undetected. Cost is modest. The information gained can be of substantial importance. Therefore, we recommend --
Stillbirth assessment should, in all instances, incorporate testing of maternal blood for evidence of massive fetal-maternal hemorrhage. Standard Kleihauer-Betke testing in any experienced laboratory is sufficient. Blood drawing can be done pre- or postpartum at the convenience of the care provider and the mother; only if caesarean section is anticipated is it important to draw the sample prior to delivery.

- In those with positive tests (25% or more of estimated fetal blood volume lost), follow up testing (at a postpartum check) should be done to rule out the possibility of a false positive because of a process (e.g. sickle cell trait) in the mother which causes persistent elevation of fetal hemoglobin.

**OBTAINING & HANDLING SPECIMENS FROM STILLBORN FOR CHROMOSOME STUDY**

**WHAT SAMPLES SHOULD BE OBTAINED?**
If there is any maceration, the placental sample will be the most useful. It should be from the fetal side, shipped fresh in tissue culture medium or saline.

Cord blood is useful primarily for intrapartum or immediate neonatal deaths. Postmortem samples from internal tissues or skin are valuable as a backup for additional studies in the future, but are not the primary source for cytogenetic studies. Backup tissues should be stored frozen, not fixed.

**WHAT TEST SHOULD BE ORDERED?**
There are now two different tests available for chromosome studies on products of conception.

1) Karyotype—This is the same study we have been using routinely and, when done on POC, is virtually always covered by the mother’s insurance. Because it depends on tissue culture there is a 30% failure rate, which can be partially overcome by ordering reflex to fluorescence in situ hybridization (FISH) to rule out common trisomies.

2) Snp Microarray—This is a newer test which detects subtle deletions and duplications missed on routine karyotype. Because it does NOT depend on tissue culture the success rate is much higher than for karyotype. The SNP array is now the test recommended by The American College of Obstetrics and Gynecology for evaluation of stillbirth and when done on POC is usually covered by the mother’s insurance. (It is important to specify SNP array as some older types of arrays did not detect triploidy.)
WHERE AND HOW SHOULD SAMPLES BE SENT?
You may use any laboratory preferred by your institution. You may wish to contact the laboratory directly for more specific instructions on specimen requirements and shipping. Most major laboratories offer SNP array on fresh or cultured tissue but only a very limited number can test fixed tissues. If you have difficulty identifying an appropriate laboratory, please contact the WiSSP director or any Genetic Counselor for assistance.

IS THERE OTHER TESTING TO CONSIDER?
Additional testing may sometimes be recommended based on findings from autopsy and/or WiSSP evaluation. This will usually require cultured cells or frozen tissue from which DNA can be extracted. Therefore it is useful when possible to obtain extra fresh tissue and/or to ask that the laboratory performing testing save any extra sample or tissue cultures until evaluation is complete. Commercial DNA banking is also an option. Recently one laboratory (PreventionGenetics) has developed a Comprehensive Sequencing Panel for Miscarriage, Stillbirth & Neonatal Death. This is a sequential test which begins with SNP array and then proceeds to testing for other genetic disorders which are implicated as causes of stillbirth, yet are difficult to detect during routine examination of a small or macerated fetus (such as various causes of hydrops, fetal akinesia, and sudden cardiac death). If an abnormality is detected on the SNP array, insurance is billed only for that portion of the test. In cases with a normal SNP array, the same sample is used for the second tier of testing. If a SNP array or chromosome studies done elsewhere are normal, just the second tier can be ordered.