

## Perinatal Mortality Guideline 5

# INVESTIGATION AND ASSESSMENT OF STILLBIRTHS

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### *INTRODUCTION*

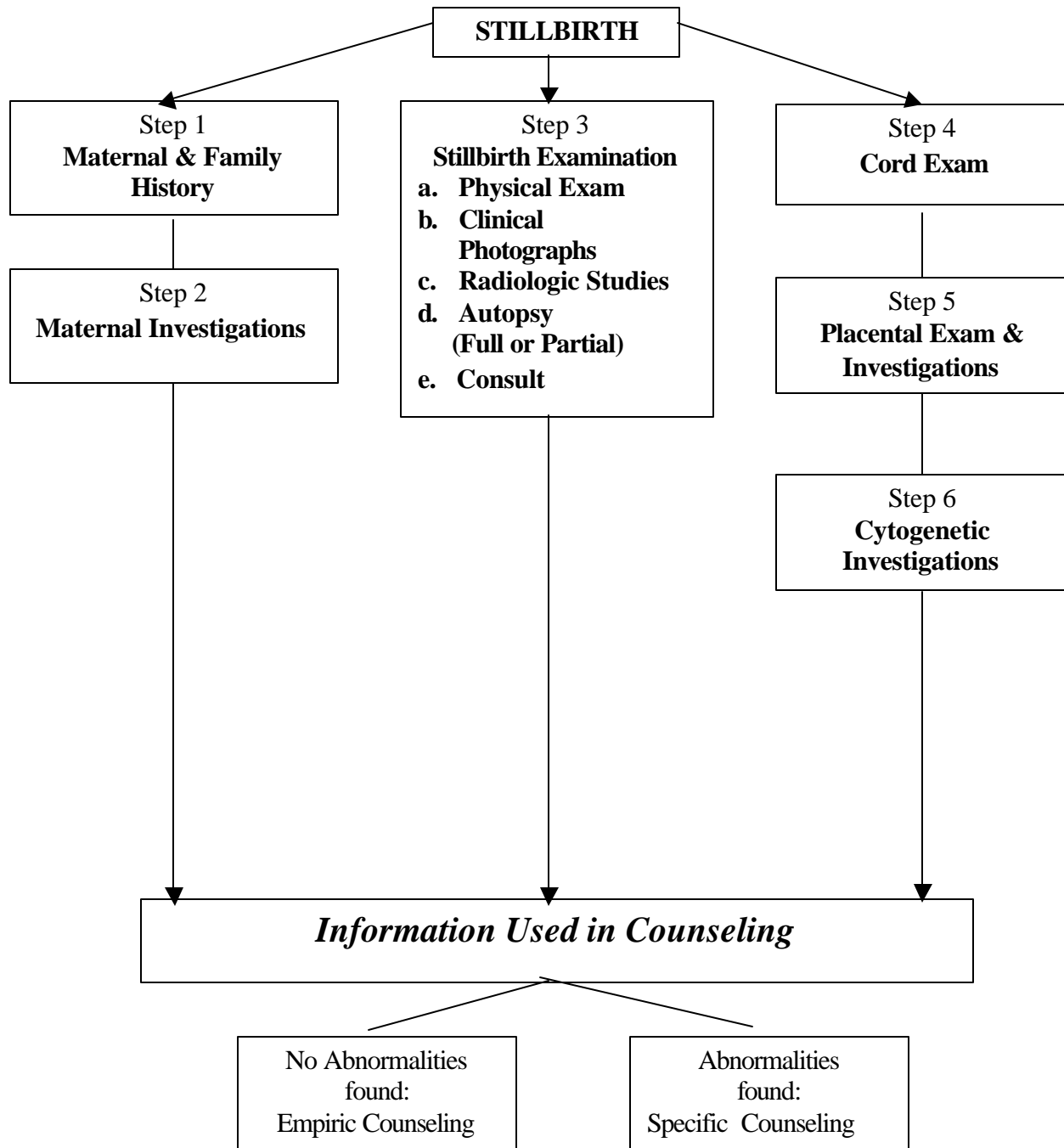
In British Columbia in 1997 there were 44,707 total births and of those, 336 were stillbirths. The stillbirth rate in 1997 was 7.5 per 1,000 total births, higher than the five-year average rate of 6.84 per 1,000 total births for the 1993-1997 period.

This guideline provides a suggested protocol for the assessment of a stillbirth, using materials and algorithms modified from the Wisconsin Stillbirth Service (WSS, 1994), and an Alberta draft document titled *Investigation of Stillbirths Protocol* (1998). We recognize that each stillbirth can contain circumstances that may modify the implementation of these procedures, limit the relevance of one or more of the procedures recommended, or require specific additional areas of investigation. However, this guideline has been created **to identify a comprehensive approach to the investigation of a stillbirth**. The best results will be attained when the investigation can be as complete as possible. The information obtained will assist in discussions with the parents, assist in the planning of future perinatal care for the family, and contribute to the understanding of fetal demise. Collectively, an increase in our body of knowledge may help to prevent future pregnancy loss and assist other parents with similar conditions.

This guideline outlines six steps in the etiological investigation of a stillbirth. These steps are presented as a checklist tool in the appendices to facilitate use in the clinical setting. The goal is that all relevant information is collected at the appropriate time and that the information is directed to the pathologist so that (s)he may conduct a thorough and complete post mortem investigation. The guideline also includes appendices on the clinical external stillbirth examination at the time of delivery, stillbirth autopsy and request; information for practitioners, autopsy information for parents, clinical photographs of stillbirths, radiologic studies of stillbirths, cytogenetic studies in stillbirth investigations and information on the cytogenetic laboratories in British Columbia.

We suggest that the checklist tool for the investigation of stillbirths (Appendix 1) and the autopsy information for parents (Appendix 4) be photocopied and added to the “stillbirth” form packets that many hospitals utilize. We also encourage that the cytogenetic laboratories listed be used as a resource should any specific questions arise in relation to the investigation of a stillbirth.

**Figure 1: Algorithm for Etiologic Investigation of Stillborn Infants**  
(modified from WSS, 1994)



## **SIX STEPS IN THE ETIOLOGIC INVESTIGATION OF A STILLBIRTH**

(Adapted from the Alberta *Investigation of Stillbirths Protocol*, 1998).

See Appendix I (page 8) “Checklist Tool for the Investigation of a Stillbirth”.

### **To be done at the time of diagnosis of a stillbirth**

#### **I MATERNAL AND FAMILY HISTORY**

- A. Review past obstetric history
  - 1) Emphasize details of previous embryonic/fetal losses
- B. Review history of present pregnancy specifically with regard to:
  - 1) Gestational age
  - 2) Fetal growth
  - 3) History of bleeding
  - 4) Elevated blood pressure
  - 5) Recent illness or possible viral exposure
  - 6) Medications during pregnancy
  - 7) Substance use
  - 8) Maternal perception of fetal movements in recent past
- C. Review of antenatal investigations:
  - 1) Ultrasounds, including amniotic fluid assessments
  - 2) Laboratory investigations (including all routine antenatal blood work)
  - 3) Prenatal diagnoses (triple screen, amniocentesis, or CVS)
  - 4) Fetal Assessment (NST, biophysical profiles, Doppler ultrasound)
- D. Review family history

#### **II MATERNAL INVESTIGATIONS**

- A. Ultrasound, if possible, to evaluate for unknown congenital anomalies
- B. CBC, platelet count
- C. Kleihauer or equivalent
- D. Blood group and antibody screen
- E. HbA<sub>1</sub>C
- F. Infectious and Microbiological Investigations to be considered when:
  - Infection is suspected as an etiologic factor
  - Cause of stillbirth is not obvious

- 1) Maternal serology (IgG and IgM) for:
  - a) Parvovirus
  - b) Toxoplasmosis
  - c) Cytomegalovirus
- 2) Review chart for HIV, syphilis and rubella serology – send IgG and IgM if not previously done as part of routine antenatal blood work
- 3) Maternal blood culture for Listeria
- 4) Cervical / vaginal cultures (aerobic)

<b>To be done after delivery of a stillbirth</b>
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### III STILLBIRTH INVESTIGATIONS

#### A. Physical Exam

Perform a detailed physical examination of the fetus and placenta. See Appendix II “Clinical External Stillbirth Examination at the Time of Delivery” (page 10).

#### B. Autopsy

A full autopsy should be encouraged on all stillbirths. An autopsy is recommended even if the cause of death appears obvious. If the parents will not consent to a full autopsy, a limited autopsy should be encouraged.

See Appendix III “Stillbirth Autopsy and Request: Information for Practitioners” (page 12), and Appendix IV “Stillbirth Autopsy Information for Parents” (page 15).

A **limited autopsy** may consist of:

- 1) **External examination by a pathologist**
  - Measurements
    - a) Weight
    - b) Crown – rump length
    - c) Crown – heel length
    - d) Foot length
    - e) Internipple distance
    - f) Thoracic circumference
    - g) Abdominal circumference
    - h) Intercanthic distance
    - i) Interpupillary distance
  - Examination for evidence of meconium
    - a) In axilla
    - b) In groin
    - c) Under fingernails
- 2) **Clinical Photographs**
  - a) Obtain photographs of the stillbirth (See Appendix V, page 17)
- 3) **Radiographic studies**
  - a) Obtain a babygram (x-ray) of the stillbirth (See Appendix VI, page 18)
- 4) **Limited Tissue Biopsies**
  - a) Skin / tendon (Achilles) for cytogenetics
  - b) Liver for infection or storage disorders

- c) Opening the body cavity for confirmation of organ location
- d) Sampling of organs outside the central nervous system
- e) Sampling of all organs, including the central nervous system

**IV CORD EXAMINATION BY ACCOUCHER:** (See Guideline 4 – Clinical Examination of the Placenta)

- A. **Length** in cms
- B. **Number of vessels**
- C. **Appearance** - thin, thick, meconium stained, abnormalities
- D. **True knots** - loose or tight
- E. **Cord Blood to be drawn** - possible only if a FRESH stillbirth
  - 1) CBC, blood group, Direct Antibody Test
  - 2) Cytogenetics if there is evidence of:
    - Congenital malformation on ultrasound or seen on examination of the stillbirth
    - Hydrops
    - Severe IUGR (5<sup>th</sup> %ile on ultrasound, <3<sup>rd</sup> %ile birthweight)
    - Amniotic fluid abnormality – severe oligohydramnios or polyhydramnios
    - Ambiguous genitalia
    - Parental history of
      - a) Repeated miscarriages
      - b) Past unexplained stillbirth
      - c) Past unexplained neonatal demise
      - d) Previous child with congenital anomalies
  - 3) Culture for GBS, Listeria and coliforms if infection is suspected as an etiologic factor or the cause of the stillbirth is not obvious

**V PLACENTA** (See Guideline 4 – Clinical Examination of the Placenta)

- A. Subamniotic swabs for aerobic and anaerobic culture if infection suspected as an etiologic factor or the cause of the stillbirth is not obvious.
  - 1) Swab between the amnion and the chorion
- B. Placenta and cord to Pathology. Check with Pathology lab to determine if placenta should be sent:
  - 1) fresh
  - 2) in saline
  - 3) in formalin (Tissue sample for cytogenetics must be taken before the placenta is fixed in formalin)

**The pathologist is to determine what infectious and cytogenetic investigations are required from the placenta.**

**Tests which can be done after the autopsy / placental pathology, if cause still unknown:**

- A. Maternal Antiphospholipid Antibody testing
- B. Investigations for thrombophilias, for example:
  - 1) Factor V Leiden
  - 2) Protein S deficiency
  - 3) Protein C deficiency
  - 4) Antithrombin deficiency
  - 5) Hyperhomocysteinemia
- C. If suspicious – TB skin test of mother
  - 1) Further TB workup if positive

**VI CYTOGENETIC STUDIES** (See Appendix VII, pages 19-21)

- A. Cord blood and placental chorion and amnion samples should be taken immediately after delivery on all stillbirths and sent for cytogenetic studies if:
  - 1) The pathologist or clinician feels cytogenetic studies should be completed
  - 2) As page 5, E. 2
- B. If there is a specific concern about inheritable metabolic disease, portions of the placental villi should be submitted in cytogenetic culture media in order to establish cell cultures for possible further studies.

Note: If there is an intrauterine death and delivery is not imminent, consideration can be given to doing an amniocentesis to obtain amniotic fluid for cytogenetic studies.

***REFERENCES***

Pauli M., Reiser C. Lebovitz R., & Kirkpatrick S. (1994) Wisconsin Stillbirth Service Program: I. Establishment and Assessment of a Community-Based Program for Etiologic Investigation of Intrauterine Deaths. American Journal of Medical Genetics, 50; p. 116-134.

Pauli M. & Reiser C. (1994) Wisconsin Stillbirth Service Program: II. Analysis of Diagnoses and Diagnostic Categories in the First 1,000 Referrals. American Journal of Medical Genetics, 50; p.135-153.

Ad Hoc Committee on Investigation of Stillbirths. (1998) Investigation of Stillbirths Protocol. Alberta Medical Association.

***SUGGESTED READING***

American College of Obstetrics and Gynecology. (1995) Committee Opinion: Genetic Evaluation of Stillbirths and Neonatal Deaths, No.178: December.

**APPENDIX I  
CHECKLIST TOOL FOR THE INVESTIGATION OF A STILLBIRTH**

This checklist tool is designed to facilitate collection of information pertinent to the investigation of a stillbirth. The tool should be kept with the patient chart until the time of perinatal mortality review, and then should be removed from the chart and kept for quality assurance purposes. The completed checklist tool is prepared as a quality assurance document under Section 51 of the Evidence Act and therefore is exempt from disclosure. Please photocopy this tool for your use.

**A. When a stillbirth is diagnosed the following information should be collected if possible: Yes**

1. Is the BC Antenatal record complete and available for review?
  - a) gestational age confirmed by early ultrasound ( $\leq 20$  weeks)
  - b) past obstetrical history completed
  - c) medication use in pregnancy documented
  - d) use of recreational drugs, smoking or alcohol use queried
  - e) SFH measurements documented
  - f) blood pressures recorded
  
2. Has the woman has been asked the following questions;
  - a) When was the last time she felt fetal movement?
  - b) Has there been any recent vaginal bleeding?
  - c) Has there been any vaginal fluid loss?
  - d) Any history of possible viral infection in the pregnancy?
  
3. Are the following investigations on the chart with results?
  - a) Previous ultrasound reports?
  - b) Routine antenatal blood work?
  - c) Any prenatal diagnostic tests (Triple screen, amniocentesis, CVS, etc.)?
  - d) Any recent antenatal fetal monitoring?
  
4. Have the following investigations been organized following the diagnosis of the stillbirth?
  - a) Ultrasound to look for potential cause?
  - b) CBC, platelet counts?
  - c) Kleihauer or equivalent?
  - d) Maternal blood group and antibody screen?
  - e) Hb A<sub>1</sub>C or result of 50g glucose screen or GTT?
  - f) Infectious and microbiological investigations if indicated (to be considered whenever an infectious cause is suspected or when the cause of the stillbirth is not obvious)?
    - A. Maternal serology for:
      - Parvovirus
      - Toxoplasmosis
      - Cytomegalovirus
    - B. Maternal serology available for:
      - HIV
      - Syphilis
      - Rubella
    - C. Maternal blood culture for Listeria
    - D. Cervical / vaginal cultures

**B. After the stillbirth has been delivered the following information should be collected if possible:**

**Yes**

1. Gross physical examination of the stillbirth (as per Appendix I)?
2. Autopsy  
Full autopsy consented to? (Encourage for all stillbirths if possible)  
Limited autopsy consented to?
  - a) External examination by pathologist?  
Gross measurements?  
External examination for evidence of meconium?
  - b) Clinical photographs (as per Appendix II)?
  - c) Radiographic studies (as per Appendix III)?
  - d) Limited tissue biopsies?  
Skin / tendon for cytogenetics  
Liver for infection or storage disorders?  
Sampling of all organs, including the CNS?  
Sampling of organs outside the CNS?
3. Clinical examination of the umbilical cord (as per Guideline 4)
  - a) Length (cms)?
  - b) Number of vessels?
  - c) Appearance?
  - d) True knots?
  - e) Cord blood drawn (if fresh stillbirth)  
CBC, blood group, direct Coombs?  
Cytogenetics if indicated  
Congenital malformation?  
Fetal hydrops?  
Significant IUGR (< 5<sup>th</sup> percentile)?  
Severe fluid abnormality?  
Ambiguous genitalia?  
Prenatal history of recurrent miscarriages?  
Prenatal history of unexplained stillbirth?  
Previous child with congenital anomalies?  
Culture for Listeria, coliforms, GBS if infection suspected?
4. Examination of the placenta (as per Guideline 4)
  - a) Subamniotic swabs for aerobic and anaerobic culture if infection suspected? (swab between amnion and chorion)
  - b) Placenta and cord sent to pathology?  
(Check with local pathologist to determine if placenta should be sent fresh, in saline or fixed in formalin.)  
Pathologist to determine if infectious and cytogenetic investigations are required from the placenta.

**C. Information that can be collected if the cause of the stillbirth remains unknown after the above investigations are completed**

1. Maternal Antiphospholipid Antibody screening?
2. Investigations for other thrombophilias if indicated?
3. TB skin test of mother if suspicious (further work-up if positive)

## **APPENDIX II CLINICAL EXTERNAL STILLBIRTH EXAMINATION AT THE TIME OF DELIVERY**

A complete physical examination of the stillborn is a critical component of an etiologic investigation. This examination **should be done at the time of delivery** and can be done by the physician/midwife attending the mother, or other physician such as a pediatrician, if available. This procedure should not take long to perform since most fetuses will exhibit few, if any, external anomalies. If any anomalies are recognized or suspected, they can be examined in greater detail. The examination should be documented on the Newborn Record Part I, Section 7 “Stillbirth” and Section 8 “Physical Examination” (including stillbirths). The compiled list of external findings can be integrated with other relevant data (e.g. complete clinical history, ultrasonic, radiologic, microbiologic, cytogenetic findings, and autopsy results). A dysmorphologist can be consulted if needed.

The examination of the stillborn can be divided into five segments, and each segment requires separate and systematic examination.

### **I General** – Global evaluation of the following parameters:

- A. State of preservation: fresh or macerated (degree of maceration); intact delivery or interventions required to effect delivery
- B. Weight; gestational age; size for gestational age
- C. Measurements: circumference of head, chest and abdomen; lengths of crown-heel (with leg fully extended), crown-rump and foot
- D. Colour: vernix white or meconium stained; any lesions of skin such as vesicles, bruising

### **II Craniofacial**

- A. General impression of normality or abnormality
- B. Quantitative relationships:
  - As craniofacial height is roughly equal to the cranial vault height, abnormalities in the ratio indicate microcephaly or hydrocephaly
  - As the intercanthic distance is roughly equal to the orbit width, an abnormal ratio suggests hypo/hypertelorism
  - Abnormal ear location – normally external meatus lies above level of nostrils and long axis of the ear is nearly vertical
- C. Specific structural defects
  - Anterior – flat nasal bridge; short flat nose; small eyes; epicanthal folds; cleft lip (uni/bilateral or median); cleft palate; small mouth; down turning angles of mouth; glossoptosis and retro/prognathism
  - Posterior – anencephaly, iniencephaly and encephalocele (usually occipital)

### **III Neck**

- A. Abnormally short
- B. Thickened nuchal fold and cystic hygroma
- C. Cervical rachischisis and meningomyelocele

### **IV Trunk**

- A. Overview – presence of edema; abdominal distention and muscular development
- B. Specific Defects –
  - Ventral – omphalocele; umbilical hernia; gastroschisis; diastasis recti and prune belly
  - Dorsal – rachischisis; meningocele and meningomyelocele
  - Cord Insertion – normal location; number of vessels and juxtrafetal cord coarctation with abnormally thin umbilical ring
  - External Genitalia – absent; ambiguous and small or enlarged structures (penis, scrotum, clitoris, labia, vagina)
  - Anus – patency; imperforate; stenotic and displaced anteriorly

### **V Extremities**

- A. General – normal/abnormal length; shortening of particular segment and muscle development
- B. Specific Defects –
  - Upper – distortions; amputations; finger lengths; shape and size; poly/syndactyly and abnormal palmar creases
  - Lower – positional abnormalities of feet, toe lengths, shape and size; increased sandal space; poly/syndactyly and rocker-bottom deformity

## **APPENDIX III STILLBIRTH AUTOPSY AND REQUEST: INFORMATION FOR PRACTITIONERS**

(Prepared by Dr. Fergal Magee, Pathologist, B.C. Children's Hospital)

### **The Autopsy**

An autopsy or post mortem examination refers to the examination of someone who has died and is usually performed by a pathologist. An autopsy examination is recommended in cases of stillbirth to try to:

- identify the cause of death
- provide the family with information for the next pregnancy
- provide information about living siblings

### **What does an autopsy involve?**

An autopsy examination can involve some or all of the following:

- detailed external examination with a record of growth parameters (infant weight, crown-heel length, crown rump length, chest circumference, foot length)
- diagrammatic record of any gross abnormality identified
- photographic record of any gross abnormality identified
- x-rays of all/part of the infant
- performance of skin biopsy for cytogenetic analysis
- performance of needle biopsy of some organs (liver, spleen, kidney) to obtain tissue for microscopic examination and/or cytogenetic, molecular, biochemical, bacterial and viral analysis
- an incision to identify location of internal organs
- open biopsy of some organs while in situ (liver, spleen, lung, heart) (for microscopic examination and/or biochemical analysis or viral culture)
- swabs while organs remain in-situ for bacterial organisms
- removal of internal organs to measure weights and visually examine
- submission of small portions of organs for microscopic examination
- detailed examination of the placenta to include some or all of the following:
  - gross examination of cord, membranes, disc
  - record of trimmed weight
  - cytogenetic analysis of chorion/amnion
  - swabs for bacterial culture
  - tissue for viral culture
  - tissue for molecular analysis
  - sections submitted for microscopic examination.

### **How will the body look after the autopsy?**

During an autopsy examination the body is treated with dignity and respect. If consent is given for a limited (partial) autopsy examination there may be no incisions at all and even after a full

detailed examination there will be no marks visible when the infant's body is dressed. The face and hands are not involved in an autopsy examination.

### **How long does the examination take?**

The examination is usually completed within 3 hours, but this may vary depending on how extensive an examination is performed.

### **When will the autopsy report be available?**

The pathologist dictates the preliminary report within 24 hours of completing the initial examination. The time interval before issuing the final report depends on the extent of the autopsy. If cytogenetic analysis and microscopy have been performed, it should be available within 3 months. Health care providers connected to the case are welcome to contact the pathologist to discuss the status of the case.

### **Will the autopsy always provide the answer?**

Realistically, an autopsy will identify a clear cause of death in only 60% of cases of stillbirth. The best results are obtained if the autopsy examination is clearly focused on the clinical questions requiring answers.

### **Requesting autopsy permission from the parents.**

Requesting an autopsy is a difficult part of medical practice. The responses to a request for autopsy in a case of stillbirth are shaped by personal and cultural attitudes towards death and medical science, and by the context in which the request is made.

- **Who should request the autopsy?** Success in obtaining permission is more likely if the request is made by a health care provider with experience in dealing with such requests, and who has had some previous interaction with the family. Such an individual should have the communication skills to couch the request in humane terms while acknowledging the couple's sense of loss. Family concerns usually focus on the thought of the body being cut up and the state of the body afterwards. It is therefore important that the requester is able to deal with these concerns by:
  - a. being familiar with what the different types of autopsy examination entail
  - b. having a clear idea of the discrete questions to be answered by the examination
- **Communicating the results.** We should remember that while health care providers may see their main task as obtaining permission for an autopsy, the crucial thing for the family is obtaining appropriate feedback about its results. Permission for autopsy examination is not an end in itself; the true goal is timely communication of results to medical staff and family, and the pathologist should strive to expedite this process. A conference with the primary care provider can be arranged as soon as the final autopsy report has been generated. At this stage the health care provider and family can discuss the significance of the identified findings and counseling for possible future pregnancies can begin.

- **When should the autopsy request be made?** A family may need time to begin to come to terms with a stillbirth and unless a metabolic disorder is considered, it is perfectly acceptable to perform stillbirth autopsy up to 48 hours, or even later, after delivery.

However, if a metabolic disease is suspected (e.g. Gauchers disease, Beta Iduronidase Deficiency, etc.) a limited metabolic autopsy should be performed within 1 hours of death (so that enzyme activity studies are possible).

- **Who gives consent for an autopsy?** Autopsy consent is given by a parent or legal guardian. Consent is required for both a full autopsy and a more limited examination. If consent is refused, significant information may be obtained from the placenta.
- **Who is responsible for the cost of an autopsy?** The cost of autopsy examination is borne by the Medical Services Plan. Two issues regarding transport of the body may arise:
  - a) If BCCWH has been involved during the pregnancy and this institution requests that the autopsy examination should be performed in the Department of Pathology at Children's and Women's Hospital, then transport costs entailed in moving the body to and from BCCWH will be borne by that institution.
  - b) If health care providers from the site at which the stillbirth is delivered wish that the examination be performed at BCCWH, then the cost of transport will be borne by the site at which the delivery occurs.

MSP has not allocated funds for such transport so it is recommended that each institution address this issue and have in place funding arrangements for such an eventuality. It is not considered appropriate for a family that has just experienced a stillbirth to be further upset by a request for transport funding.

## APPENDIX IV STILLBIRTH AUTOPSY INFORMATION FOR PARENTS

(Prepared by Dr. Virginia Baldwin, Pathologist, BC's Children's Hospital)

### Why is an autopsy so important?

The *autopsy* or *post mortem examination* is an examination of someone who has died. It is performed by a pathologist – a doctor with specialized training. The examination of infants who die is important for the family, the doctors, and society for the following reasons:

- 1. An autopsy is done to discover whether the medical problem has any genetic (hereditary) significance.** This is important if the parents would like more children. It is also important information to give brothers and sisters, and other family members of the baby who has died. The more complete the medical information available to the family and their doctor, the better counseling the family will receive. They will be in a better position to assess the risks of other children being born with the same problem. In this way, an autopsy can save future heartache.
- 2. An autopsy is the best way possible to understand how and why the baby died.** Although many tests are available to diagnose disease, no test can give a diagnosis with the same degree of certainty as an autopsy. In fact, it serves as a check on the tests themselves. An autopsy is also able to detect medical problems not shown by other types of examinations.
- 3. The autopsy examination increases medical science's understanding of the disease from which the baby died.** In this way, it improves the treatment and the chance of survival of other infants with similar problems.

### What does the autopsy examine?

An autopsy examines one or more organs in the body. The organs in the body all work together. When one organ is not functioning normally, it may cause problems in many others. It is important to understand how the problem has affected the body as a whole.

### Why are there so many forms to fill out?

You will need to complete some or all of the following forms, depending on the circumstances of the death:

- 1. Registration of Stillbirth:** This form is required by law and is the basis for recording the places and causes of all stillbirths. The record helps society be alert to situations that may need investigation or improved health care services. A section of this form is completed by the parent(s) and the remainder of the form is completed by the attending physician/coroner, and funeral director.
- 2. Autopsy Permission:** This is usually signed by a parent or legal guardian. We would like parents to know that in most circumstances they can, if they choose, refuse an autopsy [full or

partial]. However, we hope that understanding the great benefits of an autopsy will help parents make the decision in favor of, rather than against, the post mortem examination. Some parents find it helpful to talk about the autopsy with their doctor, their religious advisor, a social worker or the pathologist who would be doing the examination.

- 3. The Hospital Release Form:** This form allows the Funeral Director of the parent's choice to take responsibility for transporting and caring for the child's body as requested.

### **How long does an autopsy take?**

The examination usually takes several hours. It is usually done between 8 am and 2 pm on weekdays. The family should make funeral or memorial arrangements that take into account the time needed for examination. By the same token, the pathologists will try to time the examination to accommodate the needs of the parents relating to the funeral or memorial service, if a special request is made.

Some families would like certain mementos such as special clothing to be left with the infant. The pathologist will willingly arrange this.

The pathologist sends a preliminary report to the family's doctor a few days after the examination. Later, a final report of all completed studies is also sent. This should take no more than 3 months but may occasionally take longer. The family doctor is welcome to call the pathologist to discuss the reports. Parents are also welcome to talk to their doctors and the pathologist about the reports.

### **Will there be any visible marks from the autopsy?**

We want to assure parents that the body of their child is treated with respect and dignity. Marks from the examination will not be visible when the child's body is dressed. Face and hands are not involved in an autopsy. If you would like family or friends to view your child, you can feel comfortable arranging for this with the Funeral Director or Social Worker. Please note that the Pathology Department has no appropriate viewing place.

### **Will there be any extra cost for an autopsy?**

For residents of British Columbia the cost of autopsy examination is covered by their Provincial Medical Plan.

### **Do you have any more questions?**

If there are other questions or concerns, do not hesitate to ask the doctor or the nursing staff. They will help families or direct them to the appropriate staff member.

## APPENDIX V CLINICAL PHOTOGRAPHS OF STILLBIRTHS

Photographs of the stillborn are essential in the documentation of both normality and abnormality in conjunction with a descriptive physical examination. High quality medical photographs are preferred; however, Polaroid pictures are better than no pictures at all.

***These photographs should be taken in addition to bereavement photographs, and should be adequately labeled and identified.***

Photographs should include:

- A. AP View – whole body frontal including limbs
- B. PA View – whole body back including limbs
- C. Lateral view(s) of the face
- D. Frontal View – close up of face
- E. Photos of any abnormalities

**Note:** Photographs and radiographic studies should only be taken if consent has been received from the parents(s). The discussion around performing these studies should be documented on the patient care record.

This Appendix is used with permission of the Alberta Medical Association and is adapted from their document *Investigation of Stillbirths Protocol (1998)*.

## APPENDIX VI RADIOGRAPHIC STUDIES OF STILLBIRTHS

### I BABYGRAM

Radiographs of stillborns are useful in detecting and documenting abnormalities (primarily skeletal) which may not be detected on cursory physical examination.

Investigation should include:

- A. AP plain radiograph of the whole body. The limbs should be straightened as much as possible and, if possible, placed in anatomic position resulting in AP views of both the arms and the legs. The head and all limbs including hands and feet should be included.
- B. Lateral view of the skull.
- C. If structural abnormalities are present, separate films should be taken of the abnormal parts.
- D. More detailed films will be helpful if the stillborn is obviously dwarfed, including AP and lateral of all limbs and AP of the hands and lateral spine.

### II ULTRASONOGRAPHY

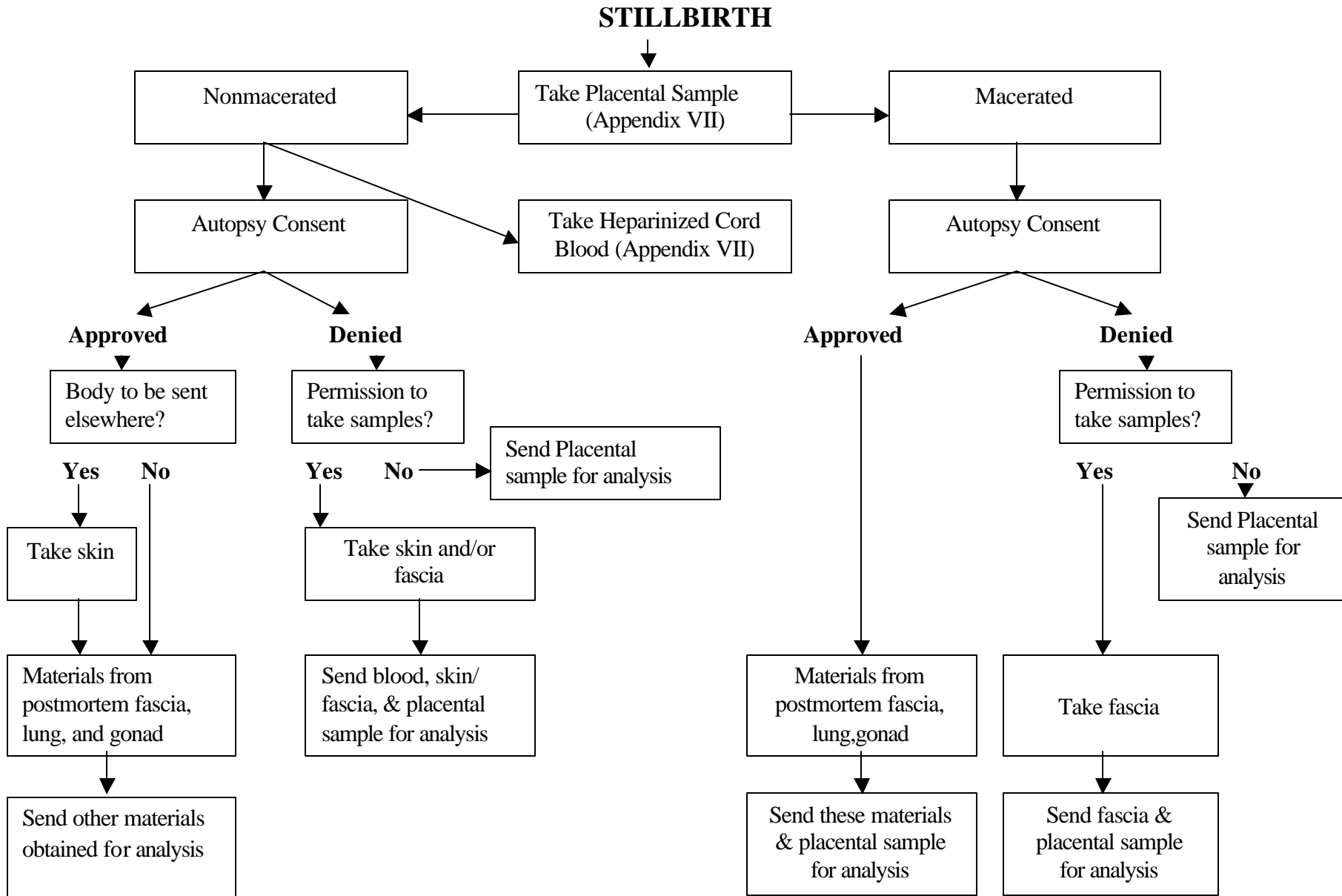
Antepartum ultrasound reports should be provided for the investigation of the stillborn. These should document any noted anomalies, fetal weight, amniotic fluid and placental abnormalities. It may be of benefit to perform an antenatal ultrasound prior to delivery of the stillborn.

Postmortem ultrasonography, where available, may be useful when the family does not consent to a full autopsy.

**Note:** Photographs and radiographic studies should only be taken if consent has been received from the parent(s). The discussion around performing these studies should be documented on the patient care record.

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**APPENDIX VII A: ALGORITHM FOR CHROMOSOME STUDIES IN STILLBIRTH**



## APPENDIX VII B CYTOGENETIC STUDIES IN STILLBIRTH INVESTIGATIONS

### I CORD BLOOD FOR CYTOGENETIC STUDIES

A cord blood sample for cytogenetic studies should be collected after delivery on all stillborns. The specimen should be stored until the clinician or pathologist decides if the specimen will be sent for cytogenetic studies.

**To Collect:** Using sterile technique, obtain 1 – 10 ml of cord blood *as soon after delivery as possible*, and place in a **heparinized green top tube**. LABEL by handwriting baby's name and indicate "stillbirth".

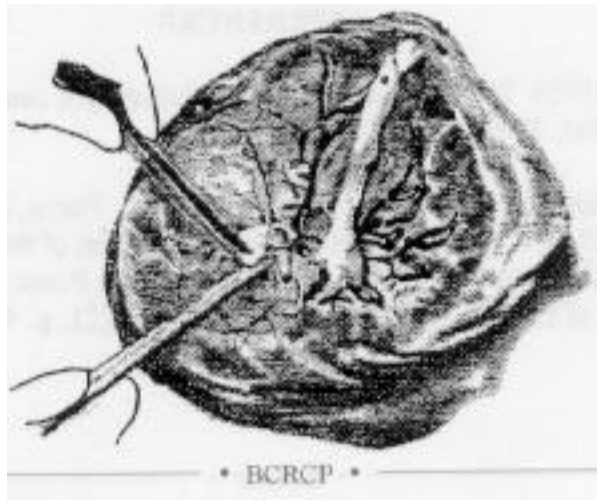
**To Store:** Store at room temperature until shipped. DO NOT FREEZE.

**To Send:** Send the cord blood sample collection to the genetics laboratory as soon as possible (appropriate timing should be determined locally in conjunction with the genetics laboratory).

### II PLACENTAL SAMPLING FOR CYTOGENETIC STUDIES (See Guideline 4 – Examination of the Placenta)

Following delivery of the placenta and prior to sending the placenta to pathology, a sample of placenta tissue should be collected on all stillborns and stored until the clinician or pathologist decides if the specimen will be sent for cytogenetic studies.

**To Collect:** Collect the placenta tissue sample from the fetal side by the site of cord insertion beneath the amnion as illustrated below. Remove 1 cm<sup>3</sup> of placenta tissue with a sterile surgical knife and dissecting forceps. The sample should be placed in sterile saline or other appropriate tissue culture media, sealed, and labeled. Ensure that the media container is completely filled as the sample may stick to the lid of the container in transport.



**To Store:** If necessary, the sample can be stored in the fridge at 4° centigrade. DO NOT FREEZE (The length of time the specimen can be stored should be determined locally in conjunction with the genetics laboratory).

**To Send:** Transport to the cytogenetics laboratory promptly.

### III HANDLING OF CYTOGENETIC SPECIMENS

- Send specimens to the lab as soon as possible
- Complete cytogenetic requisition form
- Label all vials (indicate “stillbirth” )
- Pack specimen in specimen transport containers. If there is danger of extreme cold or heat during transport, ensure sample is properly insulated.

### IV CYTOGENETIC LABORATORIES IN BRITISH COLUMBIA

A. Cytogenetic Laboratory  
Room L225, Cellular Pathology  
**Children’s and Women’s Health Centre of British Columbia**  
4480 Oak Street,  
Vancouver, B.C. V6H 3V4

Tel: (604) 875-2304  
Fax: (604) 875-3601

B. Cytogenetics Laboratory  
**Royal Columbian Hospital**  
330 East Columbia Street  
New Westminster, B.C. V3L 3N7

Tel: (604) 520-4484  
Fax: (604) 520-4409

C. Cytogenetics Laboratory  
**Victoria General Hospital**  
35 Helmcken Road  
Victoria, B.C. V8Z 6R5

Tel: (250) 727-4262  
Fax: (250) 727-4295

This Appendix is used with permission of the Alberta Medical Association and is adapted from their document *Investigation of Stillbirths Protocol (1998)*.