NEONATAL SKIN BIOPSY- CLINICAL GUIDELINE

1. Aim/Purpose of this Guideline
   1.1. This guideline is aimed at all clinical staff responsible for taking a neonatal skin biopsy.

2. The Guidance
   2.1. Background.
   Skin biopsy is used to culture fibroblasts and chondrocytes in order to diagnose chromosomal abnormalities and metabolic disorders.
   A skin biopsy is occasionally necessary for investigation of disease aetiology in a living patient. This is uncommon in neonatal practice and should only be undertaken at consultant instigation.
   A skin biopsy should be obtained immediately post-mortem in cases of sudden unexpected neonatal death, or unexplained death following sudden unexpected postnatal collapse.
   Note that for postmortem paediatric skin biopsies carried out in any other registered location (Emergency and Maternity Departments), the corresponding operational policies for correct sample documentation and tissue sample recording in that location should be followed.

2.2 RESPONSIBILITIES
   This procedure and the related consent process can be undertaken by a middle grade or consultant grade paediatric or neonatal doctor who is familiar with the procedure. It is the responsibility of the clinician to undertake procedures within their competency, and to carry out neonatal skin biopsy according to this standard operating procedure.

2.3 DEFINITIONS
   DNA: DeoxyriboNucleic Acid
   RCHT: Royal Cornwall Hospitals Trust

2.4. DOCUMENTATION
   Information Sheet for Parents and Carers (Appendix 3)
   Consent Checklist for Clinicians Seeking Parental Informed Consent (Appendix 4)

2.5. ACTIONS AND METHODS

   HEALTH AND SAFETY

   COSHH

   Chemical Hazards: Nil

   Biological Hazards: This procedure involves tissue and blood or other body fluids which must all be treated as potentially infectious (HIV, Hepatitis etc). Information on protective measures is found within Health & Safety procedures.

   OTHER HAZARDS
2.6 Laboratory processing and investigation

Fibroblasts from skin biopsy samples are used to extract DNA which is then stored indefinitely as long as appropriate consent is documented on the consent form.

Fibroblast cells can also be cultured by the Genetics Laboratory, and the resulting cell culture stored indefinitely in liquid nitrogen. This enables future further DNA extraction and metabolic testing. Cultured fibroblasts are always stored indefinitely in cases of sudden unexpected childhood death, or following pregnancy loss with evidence of fetal anomaly. In other situations, long term storage of cultured fibroblasts requires a specific request. Appropriate consent should be obtained (see below).

It is important to note that fibroblast culture from skin biopsy is not always successful.

2.7 Consent

Written informed consent should be obtained before undertaking skin biopsy as an elective investigation in a living patient. Written informed consent is also expected by the Human Tissue Authority for post-mortem samples.

When a skin biopsy is undertaken post-mortem as part of sudden unexpected death investigation, the necessary investigations including skin biopsy should be discussed with the parents and this discussion should be documented clearly in the patient’s notes.

In all cases, explanation should include both the process itself and the need for DNA and skin fibroblast storage to enable future genetic or metabolic investigation should this be needed. The skin biopsy information sheet (Appendix 3) and consent checklist (Appendix 2) should be used. The consent checklist should be used in conjunction with the current RCHT generic consent form, and filed with a copy of the consent form in the patient’s notes as evidence of consent to genetic analysis and tissue storage.

2.8 Setting

In all cases, respect the dignity of the baby, whether living or deceased. Sampling can take place in any clinical area of the Neonatal Unit, but the following must be observed:

1. Invite the baby’s parents to leave while the sample is taken.

2. Ask all other parents or visitors to leave the clinical area while the sampling takes place.

3. Ensure that the cot or incubator space is adequately screened to ensure privacy.
2.9  **Location of equipment for neonatal use**

The skin biopsy kit can be found in the Neonatal Unit Bereavement Cupboard, which is located in the NNU Housekeepers’ Room.

3.0  **Biopsy method**

1. Make sure that the area you are sampling is clean. An infected or contaminated skin specimen will cause the fibroblast culture to fail. Use sterile instruments and gloves.

2. Clean the skin for 30 seconds with an alcohol or chlorhexadine based solution. Rinse with sterile water and allow to dry.

3. Pull the skin around the biopsy area tight, to immobilise the skin. The area recommended to sample from is the antero-lateral aspect of the upper thigh.

4. Place the disposable biopsy punch tool at a perpendicular angle to the skin surface, then introduce it firmly onto the skin.

5. The punch ‘needle’ should be rotated back and forth to allow the cutting edge to carry the punch down through the tissue. The guard on the sterile biopsy punch tool will prevent too deep a penetration.

6. Withdraw the punch ‘needle’ whilst applying pressure on the puncture site. This will obtain the specimen. Remove the specimen gently from the punch using a needle.

7. If the cylindrical specimen remained in situ, gently lift it from the site using a 21 gauge needle (forceps may crush the specimen and damage it so it will not culture). Cut the specimen free from its base with tiny iris scissors or a scalpel. (diagram overleaf)

8. Place the specimen in a sterile universal container and use sterile normal saline to cover the sample. Ensure the lid is replaced snugly.

9. Apply pressure to the site and close with Steristrips®, and cover with a dry dressing. In living patients the area should be covered with a pressure dressing to stop any bleeding.

3.1  **Sample Handling and Processing**

1. The skin biopsy is posted by the RCH Biochemistry laboratory to the Bristol Genetics Laboratory.

2. Label the container and the Bristol Genetics lab request slip with correct patient details, hospital, consultant, and date/time of sampling.
3. Write “Fibroblast culture for storage” on the request slip. Where skin biopsy is undertaken post-mortem as an investigation following sudden unexpected neonatal death, “SUDI” should also be written on the request slip.

4. Place the container into a sealed lab specimen plastic bag, and put the lab request slip in the bag’s pocket.

5. Place the specimen pot into one of the specific cardboard boxes provided (kept in Neonatal Unit Bereavement Cupboard, in the NNU Housekeepers’ Room).

6. The box should then be sent to the RCH Biochemistry labs ASAP for storing in their fridge until it can be sent to Bristol Genetics Lab at Southmead Hospital during office hours. Do not freeze.

7. (FYI: further clarification re: cytogenetics testing can be found on the back of the lab slip)

8. Please document in the medical records where the skin biopsy has been taken and document discussion with parents and consent if applicable.

9. For skin biopsy specimens taken post-mortem, the investigations sheet from the Child Death Policy must be completed by the person taking the samples. This will be used for auditing purposes in the future.

10. It is a requirement of the Human Tissue Authority that every post-mortem skin biopsy sample and dispatch from NNU is recorded in a sample tracking log. This is in paper form in a clearly labelled A4 file, kept in Ward Clerk’s Office on NNU. It is the responsibility of the person doing the skin biopsy to complete this log.
4. Monitoring compliance and effectiveness
This part must provide information on the processes and methodology for monitoring compliance with, and effectiveness of, the policy using the table below.

<table>
<thead>
<tr>
<th>Element to be monitored</th>
<th>Key Changes to practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead</td>
<td>Dr. Paul Munyard</td>
</tr>
<tr>
<td>Tool</td>
<td>Audit</td>
</tr>
<tr>
<td>Frequency</td>
<td>As dictated by audit findings</td>
</tr>
<tr>
<td>Reporting arrangements</td>
<td>Child Health Directorate Audit and Consultant led Neonatal clinical Guidelines Group</td>
</tr>
<tr>
<td>Acting on recommendations and Lead(s)</td>
<td>Dr. Paul Munyard. Consultant Paediatrician and Neonatologist.</td>
</tr>
<tr>
<td>Change in practice and lessons to be shared</td>
<td>Required changes to practice will be identified and actioned within 3 months. A lead member of the team will be identified to take each change forward where appropriate. Lessons will be shared with all the relevant stakeholders</td>
</tr>
</tbody>
</table>

5. Equality and Diversity
a. This document complies with the Royal Cornwall Hospitals NHS Trust service Equality and Diversity statement which can be found in the ‘Equality, Diversity & Human Rights Policy’ or the Equality and Diversity website.

b. Equality Impact Assessment
The Initial Equality Impact Assessment Screening Form is at Appendix 2.
Appendix 1. Governance Information

<table>
<thead>
<tr>
<th>Document Title</th>
<th>Post Mortem Skin Biopsy - Neonatal Clinical Guideline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date Issued/Approved:</td>
<td>30 September 2015</td>
</tr>
<tr>
<td>Date Valid From:</td>
<td>November 2015</td>
</tr>
<tr>
<td>Date Valid To:</td>
<td>November 2018</td>
</tr>
<tr>
<td>Directorate / Department responsible (author/owner):</td>
<td>Dr Munyard. Consultant Paediatrician and Neonatologist</td>
</tr>
<tr>
<td>Contact details:</td>
<td>(01872) 252667</td>
</tr>
<tr>
<td>Brief summary of contents</td>
<td>This guideline outlines the process of obtaining a neonatal post mortem skin biopsy.</td>
</tr>
<tr>
<td>Suggested Keywords:</td>
<td>Neonatal. Skin biopsy. Post mortem</td>
</tr>
<tr>
<td>Target Audience</td>
<td>RCHT</td>
</tr>
<tr>
<td>Executive Director responsible for Policy:</td>
<td>Executive Director</td>
</tr>
<tr>
<td>Date revised:</td>
<td>30:09:2015</td>
</tr>
<tr>
<td>This document replaces (exact title of previous version):</td>
<td>Post Mortem Skin Biopsy SOP</td>
</tr>
<tr>
<td>Approval route (names of committees)/consultation:</td>
<td>Consultant approval. Child Health Directorate Audit. Neonatal Clinical Guidelines Group</td>
</tr>
<tr>
<td>Divisional Manager confirming approval processes</td>
<td>Sheena Wallace</td>
</tr>
<tr>
<td>Name and Post Title of additional signatories</td>
<td>Not Required</td>
</tr>
<tr>
<td>Signature of Executive Director giving approval</td>
<td>{Original Copy Signed}</td>
</tr>
<tr>
<td>Publication Location (refer to Policy on Policies – Approvals and Ratification):</td>
<td>Internet &amp; Intranet</td>
</tr>
<tr>
<td>Links to key external standards</td>
<td>None</td>
</tr>
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</table>
Related Documents:

   http://www.gosh.nhs.uk/health-professionals/clinical-guidelines/skin-biopsy-punch-method
2. American Assn of Family Physicians, (diagram)
   http://www.aafp.org/afp/20020315/1155.html

Training Need Identified? No

Version Control Table

<table>
<thead>
<tr>
<th>Date</th>
<th>Version No</th>
<th>Summary of Changes</th>
<th>Changes Made by (Name and Job Title)</th>
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<tbody>
<tr>
<td>Feb 2012</td>
<td>V1.0</td>
<td>Initial issue.</td>
<td>Andrew Collinson. Consultant Paediatrician and Neonatologist</td>
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</table>

All or part of this document can be released under the Freedom of Information Act 2000

This document is to be retained for 10 years from the date of expiry.

This document is only valid on the day of printing

Controlled Document

This document has been created following the Royal Cornwall Hospitals NHS Trust Policy on Document Production. It should not be altered in any way without the express permission of the author or their Line Manager. If this document is revised or updated, a copy of the updated version must sent to the RCHT Human tissue Authority Designated Individual for Human Tissue Sampling, Pathology Department to ensure correct version control.

Appendix 2. Initial Equality Impact Assessment Form

Name of the strategy / policy / proposal / service function to be assessed (hereafter referred to as policy) (Provide brief description):
### 1. Policy Aim*
Who is the strategy / policy / proposal / service function aimed at?

This guideline is aimed at clinical staff responsible for taking a neonatal post mortem skin biopsy.

### 2. Policy Objectives*

As above.

### 3. Policy – intended Outcomes*

Audit

### 4. *How will you measure the outcome?*

Audit

### 5. Who is intended to benefit from the policy?

Medical and nursing staff.

### 6a) Is consultation required with the workforce, equality groups, local interest groups etc. around this policy?

No. Consultant led Neonatal Guidelines group approved.

### 6b) If yes, have these *groups been consulted?*

N/A

### 6c) Please list any groups who have been consulted about this procedure.

N/A

### 7. The Impact

Please complete the following table.

Are there concerns that the policy **could** have differential impact on:

<table>
<thead>
<tr>
<th>Equality Strands:</th>
<th>Yes</th>
<th>No</th>
<th>Rationale for Assessment / Existing Evidence</th>
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</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td><strong>Race / Ethnic communities /groups</strong></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Disability - learning, physical disability, sensory impairment and mental health problems</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religion / other beliefs</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marriage and civil partnership</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pregnancy and maternity</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sexual Orientation, Bisexual, Gay, heterosexual, Lesbian</td>
<td>x</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

You will need to continue to a full Equality Impact Assessment if the following have been highlighted:

- You have ticked “Yes” in any column above and
- No consultation or evidence of there being consultation - this excludes any policies which have been identified as not requiring consultation. or
- Major service redesign or development

8. Please indicate if a full equality analysis is recommended. **No**

9. If you are not recommending a Full Impact assessment please explain why. **No area indicated**

Signature of policy developer / lead manager / director
Dr Paul Munyard

Date of completion and submission 10:11:2015

Names and signatures of members carrying out the Screening Assessment
1. 2.

Keep one copy and send a copy to the Human Rights, Equality and Inclusion Lead, c/o Royal Cornwall Hospitals NHS Trust, Human Resources Department, Knowledge Spa, Truro, Cornwall, TR1 3HD

A summary of the results will be published on the Trust’s web site.

Signed _______Kim Smith_______

Date _____10:11:2015___________
Appendix 3

Skin Biopsy in Babies and Children
Information Sheet for Parents and Carers

What is a skin biopsy?

Taking a “biopsy” means obtaining a sample of tissue from part of the body. Every part of our body is made of cells, and although we are made up of many different types of cells, they all share the same genetic code. This includes the cells in our skin. A punch skin biopsy is a simple procedure that removes a piece of skin tissue for medical investigation.

What is the purpose of a skin biopsy?

The piece of skin that is biopsied contains cells called fibroblasts. These can be examined under a microscope or grown (“cultured”) in the laboratory. The cultured cells can then be tested to look for genetic abnormalities. They can also help us to work out if there is a “metabolic” disorder – an illness caused by problems with chemical processes inside the body’s cells.

The reason for your child’s biopsy will be discussed with you fully by your child’s doctors.

How is a skin biopsy done?

The whole procedure takes a few minutes only. The biopsy consists of a tiny circular piece of skin, about 2 millimetres. It is usually taken from the top of the thigh at the front.

The area of skin can be numbed if necessary using a local anaesthetic injection. The nurse or doctor will clean the area of skin thoroughly.

The skin biopsy needle is gently inserted into your child’s skin, rotated and a small circle of skin is carefully removed. The sample of skin will be sent to the laboratories for examination under a microscope and/or to grow cells from the underneath surface.

The biopsy site may bleed slightly straight after the procedure, but this will stop when pressure is applied to the site. The area will be held closed using Steristrips®, which are
like strong sticky plasters, and then covered with a dressing. If necessary the area is then covered with a pressure dressing to stop any bleeding.

**What will happen to the biopsy sample?**

The skin biopsy sample is sent to Bristol Genetics Laboratory. The DNA is removed from some of the fibroblast cells for genetic investigation and indefinite frozen storage if you have given your consent for this.

Other fibroblast cells are cultured, frozen and stored indefinitely if this has been requested and you have given your consent. Please note that the process of culturing fibroblast cells is not always successful.

Storage of DNA and fibroblasts can be important, because unfortunately medical investigations - including skin biopsy tests - do not always reveal the cause of a child’s illness at the time. In such cases, new information or future scientific knowledge can sometimes point to a possible cause that can be checked for in the stored samples.

Growing fibroblasts often takes 4-6 weeks, so if metabolic tests have been requested the results may be available within 6-8 weeks. However, sometimes more specialised tests have to be sent away to a different laboratory that doesn’t do such tests frequently, and results of these can take up to six months to come back. Analysing the genes responsible for a disease (carried on the DNA) can also take several months.
### Consent Checklist for Clinicians Seeking Parental Informed Consent

<table>
<thead>
<tr>
<th>Statement</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have provided the patient's parent or legal guardian with the parent information sheet on skin biopsy in babies and children.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have provided the patient’s parent or legal guardian with the opportunity to ask questions about the proposed skin biopsy and have answered questions in accordance with the guidance document.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have explained that the sample will be sent to the Regional Genetics Laboratory in Bristol for analysis and the patient’s parent or legal guardian has consented to this.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have explained that the skin biopsy sample is for the purpose of genetic and/or metabolic testing and the patient’s parent or legal guardian has consented to this.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have explained that it is possible that the cells from the skin biopsy may not grow in the laboratory and that this may limit the information that is available.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have explained that long-term storage of the skin biopsy sample is recommended and the patient’s parent or legal guardian has consented to this.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have explained that no future tests will be done on the skin biopsy sample without parental or legal guardian consent.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have explained that health professionals will share information from analysis of the skin biopsy with the patient’s parent or legal guardian.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have explained that the patient’s parent or legal guardian has the right to withdraw consent to storage of this sample in the future.</td>
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</tbody>
</table>

Signed: ……………………………………………………………………..(Doctor)

Name: ………………………………………………. Date …………………………………………