




<b>GUIDELINE FOR CLINICAL STAFF ON VENEPUNCTURE</b>	
<b>Version Number</b>	V2
<b>Date of Issue</b>	December 2016
<b>Reference Number</b>	VG-11-2016-ROSLPFON-V2
<b>Review Interval</b>	3 yearly
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<b>Document Review History</b>		
<b>Review Date</b>	<b>Reviewed By</b>	<b>Signature</b>
2019		

<b>Document Change History</b>	
<b>Change to Document</b>	<b>Reason for Change</b>

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## 1.0 Introduction

It is the Guidance of **Our Lady's Children's Hospital** that staff undertaking peripheral venepuncture must have successfully achieved competence in the skill of venepuncture. For nursing staff completion of an education programme that is compliant with the HSE Guiding Framework for the Education, Training and Competence Validation in Venepuncture and Peripheral Intravenous Cannulation for Nurses and Midwives (2009). Staff undertaking venepuncture will do so in accordance with the procedural elements as outlined in this guideline.

## 2.0 Purpose

The purpose of this guideline is to:

- Outline the roles and responsibilities of the staff member undertaking the skill of venepuncture
- Set out procedures based on best evidence, aligned with the national HSE standardised approach, which safeguard the child and guide the nurse or midwife in the performance of venepuncture.
- Aid in the preparation and support of children and their families while undergoing venepuncture.

## 9.0 Scope

This guideline applies to all medical and nursing staff who carry out Venepuncture on infants and children in OLCHC

## 4.0 Procedural Guideline for the Venepuncture Procedure

Venepuncture is the procedure of entering a vein with a needle and is undertaken to:

- obtain a blood sample for diagnostic purposes using haematological, biochemical and bacteriological analysis
- Monitor levels of blood components.


## 5.0 Considerations When Undertaking the Venepuncture Procedure

Venepuncture is one of the most common invasive procedures and can be traumatic for the child and family. It should only be ordered when necessary. A clinical assessment should be undertaken prior to the venepuncture procedure. The "Children First National Guidelines for the Protection and Welfare of Children (DOHC, 2011) should be adhered to.

### 5.1 Iatrogenic Anaemia

Iatrogenic anaemia or iatrogenic blood loss is the regular removal of blood for testing purposes over a short period of time. It is especially important with neonates and infants as they have smaller blood volumes and may need to have blood transfusions to replace the blood removed.

Coordination is needed between physicians, nurses and midwives and laboratories to minimise duplication of blood orders and to ensure the collection of the minimum amount of blood specimens

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required for testing. Please refer to local organisational policy for the maximum amount of blood that can be drawn from children.

## 6.0 Preparation for Procedure

### Informed Consent

Informed consent should be obtained from the child and/or parent/legal guardian prior to the procedure and as per local organisational policy. (National Consent Policy, 2013) Informed consent is obtained from the parent/legal guardian or next of kin in the following circumstances:

- If a child is under the age of consent (16 years)
- If the child does not have the cognitive ability to understand or make an informed decision

If the parents and/or child do not speak English, arrangements must be made to ensure the procedure is understood and the consent is valid. The child should be involved in the decision making process and be given adequate information and explanation. Identify preferences in relation to the venepuncture site should be discussed (Dominant hand, clothing worn and thumb sucking hand etc).

## 7.0 Clinical Holding

Minimal restraint and holding should be used for the venepuncture procedure. Restraint used should be appropriate to age, cognitive ability and behavior of the child. Please refer to local organisational policies on clinical holding and the restraining of children. For further information, please read "Restraining, Holding still and Containing Young Children (RCN, 2003) and 'Children First National Guidelines for the Protection and Welfare of Children' (Department of Health & Children 2009)

### 7.1 Psychological, Pharmacological and Non Pharmacological Methods of Pain Relief


Anxiety associated with venepuncture can be reduced by good communication skills, diversion, and distraction and relaxation techniques. Children's previous experiences with venepuncture should also be taken into consideration and measures applied that previously relieved pain and anxiety (Lavery 2005). The need for local anaesthetic agents prior to the procedure should be considered on an individual basis (Scales, 2005). Please see appendix i for more information on ppsychological, pharmacological and non-pharmacological methods of pain relief.

### 7.2 Topical Anaesthetic Agents

Topical anaesthetic agents such as Ametop Gel, EMLA Cream and Ethyl Chloride Spray produce numbness of the skin and have been proven to reduce the pain experienced during the venepuncture procedure (Dougherty, 2008). Details of topical anaesthetic agents are:

**Ametop Gel:** Consists of Amethocaine 4% Gel. Indications: Adults and children over 1 month. Application Time: Minimum of 30 minutes prior to procedure. Side Effects: Redness, swelling and itchiness.

**EMLA Cream** (Eutectic mixture of local anaesthetics). Consists of: Lidocaine and Prilocaine 5% Cream. Indications: Adults and children over 1 Year. Application Time: Minimum of one hour prior to procedure.

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**Side Effects:** Redness, swelling and itchiness.


**Ethyl Chloride Spray:** Consists of: Ethyl Chloride Spray. Indications: Use if allergic to or has poor tolerance or anxiety relating to other agents or occlusive dressings. Suitable in emergency situations due to its immediate action. Application Time: Immediate. Side Effects are extremely rare and include: cutaneous sensitisation, pigmentation. Overexposure can lead to headaches, dizziness, vomiting, loss of co-ordination and disorientation.

Topical anaesthetic agents should be applied to a limited number of locations only, as excessive use of agent can be harmful when absorbed (Scales 2005 and Franurik *et al* .,2000). Infants should be supervised when agents are applied in case of accidental ingestion. Topical anaesthetic agents must be prescribed on an individual basis and be used according to manufacturer's instructions. Current practice does not advocate the application of any anaesthetic agents for neonates, instead sucrose/glucose may be used for babies over 32 week's gestation as prescribed.

## 8.0 Vein Selection in Children

Choosing the correct vein is important. When selecting the appropriate site of vein for venepuncture, it is best practice to begin in the most distal aspect of the vein. This allows for further attempts above the selected vein which will not have been impeded. When cannulating children, the specific advantages and disadvantages of potential venepuncture sites must be considered. These are outlined below:

<b>Median Cubital Vein in the Antecubital Fossa</b>	<p><b>Advantages</b></p> <ul style="list-style-type: none"> <li>• Deep veins with rich blood supply</li> <li>• Easy to palpate</li> <li>• Well supported by subcutaneous tissue (prevents vein rolling under the needle)</li> <li>• Accessible in thin people</li> </ul> <p><b>Disadvantages</b></p> <ul style="list-style-type: none"> <li>• Brachial artery and radial nerve in close proximity</li> <li>• Difficult to locate in child with increased subcutaneous fat</li> </ul>
<b>Cephalic and Basilic Veins in the Forearm</b>	<p><b>Advantages</b></p> <ul style="list-style-type: none"> <li>• Larger veins</li> </ul> <p><b>Disadvantages</b></p> <ul style="list-style-type: none"> <li>• Cannot be used if site is used for arteriovenous fistula not really seen in children</li> <li>• Not well supported by subcutaneous tissue (vein can roll from needle)</li> <li>• Brachial artery close to both veins</li> <li>• Median nerve close to basilic vein</li> <li>• Radial nerve close to cephalic vein</li> </ul>
<b>Metacarpal Veins</b>	<p>The metacarpal veins would be the first choice for neonates and infants under 2 years as other veins may not be accessible due to higher levels of subcutaneous fat.</p>

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<b>in the Dorsal Venous Network</b>	<p><b>Advantages</b></p> <ul style="list-style-type: none"> <li>• Easily accessible, easily visualised and palpable</li> <li>• Prominent in obese patients</li> </ul> <p><b>Disadvantages</b></p> <ul style="list-style-type: none"> <li>• Difficult to secure</li> <li>• Skin can be delicate and subcutaneous tissue is diminished (small veins may only offer small volumes of blood)</li> <li>• Only suitable for small blood collection set (23G Butterfly system)</li> </ul>
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Children may also require venepuncture in either the **leg or foot**. These are not very common sites and should only be carried out by suitably trained personnel when all other sites are inaccessible.

## 9.0 Clinical Assessment

A clinical assessment should be carried out by the nurse or midwife prior to the venepuncture procedure. Consideration must be given to the child's developmental, cognitive and mobility needs when selecting a site. A Four Step Approach is outlined as follows:

### Check


- the indication for venepuncture to determine equipment and specific bottles to use
- if patient has fasted as required for specific tests
- the clinical condition (acute/ chronic/emergency) of the child
- location and length of the vein
- condition of the vein (visual and palpation)
- area is warm prior to the venepuncture procedure (veins constrict if cold, making the procedure more difficult)
- allergies to topical anaesthetic agents or plasters
- for needle phobia
- previous history of difficult venepuncture procedures
- increased amounts of subcutaneous fat
- for history of blood borne viruses, bleeding disorders or if receiving anticoagulation therapy

### Choose

- most distal aspect of the vein
- non dominant hand
- correct location, avoiding arteries and nerves
- appropriate equipment to undertake procedure
- appropriate topical anaesthetic agent

### Avoid

- Hard, sclerosed, fibrosed, knotty, thrombosed veins or previous venepuncture sites
- Sites with intravenous infusions in situ
- Sites that may require peripheral intravenous central catheter (PICC) insertion or arterial monitoring
- Valves in the vein (if visible or palpable)
- Veins in the upper arm in babies less than 28 weeks as this could impede long line insertion
- Duplication of blood orders, especially in children (neonates and infants) due to smaller blood volumes

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- thumb sucking hand in children
- Lower extremities sites especially when children have just started walking.
- Veins suitable for intravenous cannulation and treatment if a child requires repeated treatments such as chemotherapy.


### Do Not Use

- arm with obvious infection or bruising
- arm with a fracture
- arm with an arteriovenous (AV) fistula not really seen in children
- arm affected by a cerebrovascular accident
- arm affected by lymphedema

## 10.0 Equipment

The equipment required for the venepuncture procedure is outlined below. Equipment required should be based on the assessment of the child and the specific blood tests required.

VENEPUNCTURE PROCEDURE – CHILD	LIST OF EQUIPMENT
<ul style="list-style-type: none"> <li>• A clean clinical tray</li> <li>• Sharps container (large enough to accommodate the blood collection system).</li> <li>• Disposable non sterile Sheet-(optional in case of blood spillage)</li> <li>• *Personal Protective Equipment (e.g., 2 pairs of well-fitting non-sterile gloves, protective plastic apron, safety goggles/visor/mask with eye shield)</li> <li>• Skin disinfectant (70% impregnated alcohol wipes)</li> <li>• Alcohol Hand rub/gel</li> </ul>	<ul style="list-style-type: none"> <li>• Clean tourniquet</li> <li>• Topical anaesthetic agent if prescribed</li> <li>• **Required blood collection set</li> <li>• **Required blood specimen bottles</li> <li>• Blood requisition forms (fully completed with child details)</li> <li>• A Biohazard bag for transport of specimens</li> <li>• Non Sterile gauze-(to apply pressure and absorb blood spillages)</li> <li>• Non Sterile child friendly plaster/Band Aid</li> <li>• Reward as agreed with child and parent e.g. sticker, or certificate</li> </ul>
<p><b><i>As per Standard Precautions the use of a plastic apron and/or face protection should be assessed by each HCW based on the risk of blood splashing or spraying during the procedure.</i></b></p>	
<p><b><i>** Range and type of equipment may vary depending on local organisational policy</i></b></p>	

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## 11.0 Types of Safety Blood Collection Systems

The nurse and midwife should be familiar with the types of safety blood collection systems used in their organisation, which are outlined below.

SAFETY - MULLTIFLY SYSTEM	
<p>The Safety Multifly System can be used as an aspiration method and/or a vacuum method.</p> <p>Components in the system include:</p> <ul style="list-style-type: none"> <li>• Multi-sampling needles with pre-assembled holders</li> <li>• Needle protection devices</li> <li>• Series of specific bottles with caps of various colours which are unique to this system (The colours indicate the type of additives).</li> </ul>	<p>This blood collection system is suitable for all veins for venepuncture. It is also suitable for fragile veins.</p>

## 12.0 Types of Blood Collection Bottles and Tubes

The blood collection bottles and tubes will vary depending on the safety blood collection system utilised. The nurse or midwife should be familiar with the types of blood collection bottles and tubes used in this organisation.

## 13.0 Recommended Order of Draw

The order of blood draw is the sequence in which blood collection bottles should be filled. The needle which pierces the bottle can carry additives from one bottle into the next, and so the sequence of draw is standardised so that any cross-contamination of additives will not affect laboratory results.

The general principles applied to the order of blood draw are:

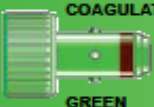
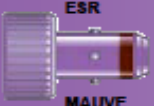
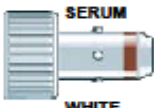



- 1<sup>st</sup>: Samples - Blood Cultures
- 2<sup>nd</sup>: Samples - anti coagulants
- 3<sup>rd</sup>: Samples - non additives
- 4<sup>th</sup>: Samples - additives (WHO, 2002)



## Appendix 1 - S-Monovette Guide


# S-Monovette® Guide

OUR LADY'S HOSPITAL FOR SICK CHILDREN, CRUMLIN  
BLOOD SAMPLING SEQUENCE

COLOUR CODE	INVESTIGATION	ORDER
 <p>COAGULATION GREEN</p>	<p>APTT,INR,D-DIMER, FACTOR ASSAYS, FIBRINOGEN, PLATELET IMMUNOPHENOTYPING, PT, PLATELET FUNCTION TESTS, LUPUS ANTICOAGULANT SCREEN, MALARIA SCREEN, ANTI-FACTOR X A, A2 ANTIPLASMIN, VON WILLEBRANDS ANTIGEN SCREEN, HEPARIN COFACTOR II</p>	<p><b>1<sup>ST</sup></b> (AFTER NEUTRAL BOTTLE)</p>
 <p>ESR MAUVE</p>	<p>ESR</p>	<p><b>2<sup>ND</sup></b></p>
 <p>SERUM WHITE</p>	<p>B12, FOLATE,VITAMIN A/D/E/K, FERRITIN, ALL ANTIBODIES LEVEL, IMMUNOGLOBULINS,IgE, RASTS,ANTIGLYCIDAN,EDOMYCELLE ANTIBODIES, ALCOHOL AUTOANTIBODY SCREEN, BETA2 GLYCOPROTEIN,A50, A50T, CARDIOLIPIN, COMPLEMENT C3, C4, C50, CH100, FSH, LH, DHEAS</p>	<p><b>3<sup>RD</sup></b></p>
 <p>LITHIUM HEPARIN ORANGE</p>	<p>U+E, LEFT'S, TFT'S, AMINO ACIDS, ACYL CARNITINE, OESTRIDOL, ALBUMIN, ALK PHOSPHATASE, AMIODASONE, CYTOGENETICS, BILE ACID PROFILE, BILIRUBIN, RENIN, C-PEPTIDE, DI-HYDROTTESTOSTERONE, HOMOCYSTENE, GLUCAGON</p>	<p><b>4<sup>TH</sup></b></p>
 <p>RED EDTA</p>	<p>BLOOD FILM, FBC, LYMPHOCYTE SUBSETS, T&amp;B CELLS, HAEMOGLOBINOPATHY SCREEN, ANTI-PLATELET AB'S, MOLECULAR GENETICS, ALL PCR BLOODS, OXIDATIVE BURST TEST, PLASMAVISCOSITY, SICKLE CELL SCREEN, RED CELL FOLATE, FK506 LEVELS, CYCLOSPORIN LEVELS, GENTAMYCIN LEVELS, HBA1C</p>	<p><b>5<sup>TH</sup></b></p>
 <p>SODIUM FLUORIDE YELLOW</p>	<p>GLUCOSE</p>	<p><b>6<sup>TH</sup></b></p>



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## 14.0 Procedure

The venepuncture procedure follows aseptic principles, using a non-touch technique. **Two** attempts **ONLY** should be made at the venepuncture. If unsuccessful refer to another practitioner. Single use closed safety blood collection systems (sanctioned for use locally) are recommended for use in accordance with manufacturer's instructions.

The procedures for infant, child and adult are specified in appendices ii and iii.

- *Venepuncture Procedure Infant – Appendix 2*
- *Venepuncture Procedure Child – Appendix 3*

## 15.0 Management of Complications


Potential problems such as patient fear and anxiety, inability to draw blood or cessation of blood flow may arise and it is important to know how these may be overcome. Complications such as haematoma, phlebitis, nerve injury, arterial puncture, venous spasm and/or needle stick injury can occur and it is important that the nurse or midwife is able to recognise treat and /or prevent them. It is critical for the nurse to detect and prevent complications arising. It is especially important for children who may not be able to verbalise pain.

## 16.0 Documentation

The nurse or midwife must be familiar with the documentation required for the venepuncture procedure. A requisition form must accompany blood samples submitted to the laboratory. The requisition form must contain the proper information in order to process the specimen.

### The essential elements of the requisition form include the:

1. surname, first name, and middle initial
2. date of birth and sex
3. identification number
4. diagnosis or symptoms
5. complete name of healthcare professional requesting test
6. date of venepuncture procedure
7. indication for the blood test(s) requested location (for example, ward, department, address)
8. All blood samples must be labelled at the bedside/in the presence of the patient and checked with the:
  - Patient Identity band (inpatient) and requisition form,
  - Parent/guardian and requisition form (Outpatient) as per OLCHC Laboratory Handbook, 2016. see <http://olchlab.return2sender.ie/Account/Login.aspx>

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## 17.0 Implementation Plan

The Director of Nursing and Midwifery is responsible for the dissemination, implementation and ongoing evaluation and audit of this policy within this organisation.


## 18.0 Evaluation and Audit

Evaluation will include:

- A mechanism for recording, reviewing and acting on adverse venepuncture incidents
- A system for maintaining practitioner competence
- A method for identifying further training needs

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