ST. LUKE'S GENERAL HOSPITAL CARLOW/KILKENNY

Feidhmeannas Seirbhíse Sláinte
Health Service Executive

Ireland East HEALTHCARE

Guideline for Undertaking Peripheral Intravenous Cannulation in Adults

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Table of Contents Page

1 POLICY STATEMENT 1

2 PURPOSE 1

3 SCOPE 1

4 LEGISLATION/ OTHER RELATED POLICIES 3

5 GLOSSARY OF TERMS/DEFINITIONS/ABBREVIATIONS 6

6 ROLES AND RESPONSIBILITIES 12

6.1 Responsibilities of all healthcare practitioners undertaking Peripheral Intravenous Cannulation 12
6.2 Responsibility of the Clinical Nurse/Midwife Manager 14

7 PROCEDURAL GUIDELINE FOR PERIPHERAL INTRAVENOUS CANNULATION IN ADULTS 18

7.1 Indications for Use of a Peripheral Intravenous Cannulation 18
7.2 Considerations for the Insertion of a Peripheral Intravenous Cannula 19
7.3 Informed Consent 20
7.4 Psychological, Pharmacological and non-Pharmacological Methods of Pain Relief 20
7.5 Vein Selection in Adults 21
7.6 Clinical Assessment 24
7.7 Types of Cannulae used for Adults 25
7.8 Equipment 26
7.9 Prior to Procedure: Preparation in designated clean clinical area 27
7.10 At the bedside: Patient Zone 27
7.11 Preparation of Sterile Field and Site 29
7.12 Cannula Insertion 30
7.13 After care 33
7.14 Post Procedure 34
7.15 Documentation 34
7.16 Care and Maintenance of an Indwelling Peripheral Intravenous Cannula site 35
7.17 Management of Potential Complications 36
7.18 Removal of the PVC 37
7.19 Replacement of a Peripheral Intravenous Cannula 37

8 IMPLEMENTATION PLAN 40

9 EVALUATION AND AUDIT 40

10 REVISION HISTORY 41

11 REFERENCES/BIBLIOGRAPHY 42

12 APPENDIX I OUTLINE OF COMBINED VENEPUNCTURE & INTRAVENOUS CANNULATION TRAINING PROGRAMME AND LEARNING OUTCOMES 46

13 APPENDIX II RECORD OF SUPERVISED PRACTICE ASSESSMENTS 48

14 APPENDIX III FINAL COMPETENCY ASSESSMENT 49

15 APPENDIX IV SKILLS COMPLETION CHECKLIST 50

16 APPENDIX V CERTIFICATE OF COMPETENCE 51

17 APPENDIX VI SKILLS PATHWAY ALGORITHM FOR PERIPHERAL INTRAVENOUS CANNULATION FOR NURSES AND MIDWIVES 52

18 APPENDIX VII ANATOMY OF UPPER EXTREMITY VEINS 54

19 APPENDIX VIII PERIPHERAL INTRAVENOUS CANNULA TYPES 56

20 APPENDIX IX MANAGEMENT OF POTENTIAL COMPLICATIONS 57

21 APPENDIX X VISUAL PHLEBITIS (VIP) SCORE 65

22 APPENDIX XI PVC INSERTION MANAGEMENT & REMOVAL RECORD /NEWS OBSERVATION CHART ADULT 66

23 APPENDIX XII PPPG DEVELOPMENT GROUP MEMBERSHIP 67

24 APPENDIX XIII PEER REVIEW OF POLICY, PROCEDURE, PROTOCOL OR GUIDELINE 68

25 APPENDIX XIV KEY STAKEHOLDERS REVIEW OF POLICY, PROCEDURE PROTOCOL OR GUIDELINE 69

26 APPENDIX XV SIGNATURE SHEETS 70

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1 Policy Statement

1.1 St. Luke's General Hospital Kilkenny is committed to ensuring that all patients undergoing peripheral intravenous cannulation receive safe and effective care.

2 Purpose

2.1 To set out guidelines which safeguard the patient and guide the practitioner in the insertion, care and management of peripheral intravenous catheters with the aim of:

- Ensuring safe use of peripheral intravenous devices
- Complying with procedures based on the best evidence and aligned with the national HSE standardised approach
- Maintaining a needle –free 'closed' intravenous system

2.2 Reducing the incidence of infection related to peripheral intravenous devices.

2.3 To ensure that all healthcare staff undertaking peripheral intravenous cannulation in St. Luke's General Hospital are aware of the standards and competencies expected in order to undertake the process safely.

3 Scope

3.1 These guidelines should be applied in all situations where patients have or are assessed for the insertion of a peripheral intravenous cannula.

3.2 The scope of this guideline applies to Medical Practitioners, Registered Nurses and Registered Midwives, Pre-Registration undergraduate BSc General Nursing Students during their internship period and the Social & Healthcare Professionals (Radiographers) employed in St. Luke's General Hospital who insert peripheral intravenous cannulae in adults as part of their role.

3.3 Peripheral Intravenous cannulation must not be undertaken by a nurse/midwife who have not satisfied the following requirements;

3.3.1 Have undertaken the theoretical component of the eLearning Module for Venepuncture and Peripheral IV Cannulation and successfully completed the Self Assessment Components online via www.hseland. The nurse/midwife must have documented evidence of a 'Pass' on the online Self Assessments Tests for both Venepuncture and Peripheral IV Cannulation before attending the Combined Venepuncture and Peripheral IV Cannulation Training Programme at St. Luke's General Hospital Kilkenny.

3.3.2 Have successfully completed the Combined Venepuncture and Peripheral IV Cannulation Training Programme at St. Luke's General Hospital Kilkenny (Refer to Appendix I).

3.3.3 Have undertaken a minimum of five successfully Clinical Supervised Practice Assessments in each skill (Refer to Appendix II and Appendix III) and obtained a Certificate of Competency achievement (Refer to Appendix V) demonstrating competence for independent practice in venepuncture and peripheral intravenous cannulation.

3.4 Medical Practitioners are an exception to the above and obtain education, training and competency in the skill of Venepuncture and peripheral venous cannulation through their own education and training curriculum.

If a medical practitioner requires further practice and development of competencies or training in using the equipment of their new employment, he/she may attend the Combined Venepuncture & Peripheral IV Cannulation Education Training Programme held in St. Luke's General Hospital Kilkenny.

3.5 Peripheral intravenous cannulation and injection of contrast media is only undertaken by Radiographers who have successfully completed an Intravenous Administration and Cannulation Course (involving both theory and practice education) for Radiographers (St. James's Hospital or University College Dublin).

On successful completion of both course and supervised practice Radiographers obtain a Certificate of Competency thus demonstrating competence for independent practice in peripheral intravenous cannulation and injection of contrast media.

4 Legislation/ Other Related Policies

Nursing & Midwifery Specific Documents:

NMBI (2014) Code of Professional Conduct and Ethics for Registered Nurses and Registered Midwives (Nursing and Midwifery Board of Ireland)

NMBI (2015a) Scope of Nursing and Midwifery Practice Framework (Nursing and Midwifery Board of Ireland)

NMBI (2015b) Recording Clinical Practice Guidance to Nurses and Midwives (Nursing and Midwifery Board of Ireland)

NMBI (2015c) Practice Standards for Midwives (Nursing and Midwifery Board of Ireland)

ABA (2007) Guidance to Nurses and Midwives on Medication Management (An Bord Altranais/ Nursing and Midwifery Board of Ireland)

Scope of Practice Document for BSc Nursing Students on Practice Placement (most recent)

Health Service Executive and Office of the Nursing & Midwifery Services Director Guiding Framework for Education, Training and Competence Validation in Venepuncture and Peripheral Intravenous Cannulation for Nurses and Midwives (2017).

SLGH Guideline for Undertaking Venepuncture in Adults (most recent).

Medical Practitioners Specific Documents:

Irish Medical Council (2016) Guide to Professional Conduct and Ethics for Registered Medical Practitioners.

Radiographer and Radiology Documents:

Irish Institute of Radiography and Radiation Therapy (2017) Intravenous Cannulation/Administration by Radiographers/Radiation Therapists.

Royal College of Radiologists (2015) Standards for intravascular contrast administration to adult patients

Health Service Executive Documents:

Health Service Executive South/South East Hospital Group Network Waterford, Wexford, Carlow/Kilkenny and South Tipperary Infection Prevention & Control Policy Manual for Acute Hospitals including Standard Precautions, Hand Hygiene, PPE, Aseptic Non-Touch Technique and Decontamination Policy.

Health Service Executive South/South Eastern Area Policy for the Safe Use, Handling and Disposal of Sharps and Sharps Containers (most recent).

Health Service Executive, Health Protection Surveillance Centre (2016) emi TOOLKIT/Guidelines for the Emergency Management of Injuries and Post-exposure Prophylaxis (PEP) including needle stick and sharps injuries, sexual exposure and human bites) where there is a risk of transmission of blood borne viruses and other infectious diseases. https://www.hpsc.ie/a-z/EMIToolkit/

HSE Code of Practice for Healthcare Records Management (2010). https://www.hse.ie/eng/about/who/qid/quality-and-patient-safety-documents/abbreviations.pdf

HSE National Health Care Records Management Advisory Group (2011) HSE Standards and Recommended Practices for Healthcare Records Management.

Health Service Executive, National Consent Advisory Group (2013) National Consent Policy. https://www.hse.ie/eng/about/who/qid/other-quality-improvement-programmes/opendisclosure/opendiscfiles/nationalconsentpolicym2014.pdf

Health Service Executive (2017) Policy on the Prevention and Management of Latex Allergy

SLGH Policy for the Segregation & Disposal of Waste (most recent)

Health Service Executive Waste Management Awareness Handbook 2014

National Documents:

CDC (2011) Guidelines for the Prevention of Intravascular Catheter-Related Infections, Centres for Disease Control and Prevention (CDC).

Health Service Executive (2017) Integrated Risk Management Policy Incorporating an overview of the risk management process.

HSE/ONMSD (2017) Guiding Framework for Education, Training and Competence Validation in Venepuncture and Peripheral Intravenous Cannulation for Nurses and Midwives.

National Hospitals Office (2007) Code of Practice for Healthcare Records Management, NHO.

SARI A Strategy for the Control of Antimicrobial Resistance in Ireland (December 2009 Updated February 2010) Prevention of Intravascular Catheter-related Infection in Ireland, SARI Prevention of Intravascular Catheter–related Infection Sub-Committee, HSE Health Promotion Surveillance Centre Dublin.
HCAI, RCPI, HSE Prevention of Intravascular Catheter-related Infection in Ireland Partial update of 2009 National Guidelines Summary of Recommendations September (2014)

5 Glossary of Terms/Definitions/Abbreviations

Glossary of Key Terms

5.1 Adult

Adult is defined as a person 16years of age and over in line with the HSE National Consent Policy (2014).

5.2 Aseptic field

Is a designated aseptic working space that contains and protects the equipment used in the procedure from direct and indirect environmental contamination by micro-organisms. In Aseptic Non Touch Technique (ANTT), aseptic fields are termed Critical or General Aseptic Fields.

5.3 Aseptic Non Touch Technique (ANTT)

An international standard for Aseptic Technique originated by Stephen Rowley in the mid 1990's provides a practice framework for Aseptic Technique to standardise practice language processes used during all clinical procedures and the insertion, maintenance and removal of invasive medical devices (Rowley et al 2010). ANTT is based on the novel concept of Key-Part and Key-Site protection. Intravenous catheter-related bloodstream infections (CRBSI) have become a leading cause of healthcare associated bloodstream infections (HCA-BSI) (HPSC 2009). The main aim of ANTT is to minimise cross contamination through the transfer of microorganisms during invasive clinical procedures.

5.4 Assessor

An assessor is an identified registered nurse or registered midwife, who has undertaken training and is certified as a competent expert practitioner in venepuncture and/or peripheral intravenous cannulation. It is recommended that nurses and midwives develop their competence within specific disciplines, according to their area of practice.

5.5 Bevel Up Position

The opening of the intravenous cannula is facing upwards towards the ceiling.

5.6 Blown

Induration or erythema, warmth, and pain or tenderness along the tract of a catheterised or recently catheterised vein (SARI 2010). Colloquialism that describes damage to a vein incurred as a result of penetration of its posterior aspect.

5.7 Cannula

is a short and flexible tube, containing a needle, or introducer, which pierces the peripheral vein, to provide access to the vascular circulation for the administration of intravenous fluids and medication.

5.8 Catheter Colonisation

Significant growth of one or more microorganisms in a quantitative or semi-quantitative culture of the catheter tip, subcutaneous catheter segment or catheter hub (SARI 2010).

5.9 Cleaning

Is defined as the reduction of bio burden and removes foreign material. In the health care environment this is typically undertaken using water and a neutral detergent or a commercially prepared wipe.

5.10 Clean Utility Room

Is a room designated for the storage and preparation of drugs and lotions, it is also the area where clean and sterile supplies are held; it may be used as a preparation area for dressings trolleys and for intravenous infusions (Health Building Note, 00-09 2013).

5.11 Competency

Is the ability of the nurse or midwife to practice safely and effectively fulfilling his/her professional responsibility within their scope of practice (NMBI 2015).

5.12 Critical Aseptic Field

Is the main aseptic field used for Surgical ANTT that requires critical management i.e. only sterilised equipment may come into contact with the field.

5.13 Dirty Utility Room

Is a room designated for the disposal of body fluids including water contamination with body fluids, exudates, patient was water. It is also used for the decontamination and storage of commodes, bedpans, emesis bowls and urine bottles. Demarcation between clean/unused equipment and dirty/soiled equipment is essential.

5.14 Disinfection

Is defined as the destruction of pathogenic micro-organisms. This may be achieved using chemical or thermal processes.

5.15 Distal

Furthest from the centre or midline of the body or trunk, or furthest from the point of attachment; the opposite of Proximal (RCN 2010).

5.16 Extravasation

Extravasation is the inadvertent administration of a vesicant medication or solution into the surrounding tissue instead of into the intended vascular pathway (RCN 1998, Perucca 2009, Stanley 2002, Polovich et al 2009, INS 2006). A vesicant solution is one that causes the formation of blisters with subsequent sloughing of tissue due to tissue necrosis (Perdue 1995). Medications that contribute to extravasation necrosis are most often osmotically active or ischaemia-inducing, or cause direct cellular toxicity (Weinstein 1997).

5.17 Flashback

Evidence of venous return in chamber of cannula.

5.18 Flashback Chamber

The proximal chamber on the cannula.

5.19 General Aseptic Field

Is the main aseptic field used for standard ANTT that promotes asepsis during procedures by providing basic protection for the care environment. Because of the small number and small size of Key-Parts, general aseptic fields do not require critical management, because Key-Parts can be easily protected by micro critical aseptic fields (caps and covers) and non touch technique.

5.20 Hand Hygiene

Hand hygiene must be performed in line with 5 moments for hand hygiene.
Perform hand hygiene using alcohol hand gel at point of care for a minimum of 30 seconds on visibly clean hands. Where hands are not visibly clean wash with liquid soap and water followed by alcohol gel. Refer to hospital Hand Hygiene Policy.

5.21 Infiltration

Infiltration is the inadvertent administration of a non-vesicant medication or solution into the surrounding tissue instead of into the intended vascular pathway (Fabian 2000, INS 2000, Hadaway 2002, Lamb & Dougherty 2008). It is one of the most common complications of intravenous therapy.

5.22 Intravenous attempt

Is defined as the needle piercing the skin (Fields et al. 2014)

5.23 Key –Parts (active)

Are the critical parts of the procedure equipment that come into contact with key sites, any liquid infusions, or with any other key parts connected to the patient via a medical device. If key-parts become decontaminated during the procedure pathogenic organisms may gain entry into the patient resulting in infection.

5.24 Key-Parts (inactive)

Are key-parts that are not deemed active until used i.e. closed IV ports. They will be rendered aseptic prior to use by effective disinfection.

5.25 Key Sites

Are defined as any portal of entry into the patient including open wounds including insertion and puncture sites for invasive medical devices.

5.26 Order of Draw

Refers to the sequence in which blood collection bottles should be filled (WHO 2010).

5.27 Patient

Is a person who uses health and social care services. In some instances, the term client, individual, person, people, resident, service user, mother, or baby are used in place of the term patient depending on the health or social care setting (NMBI 2014).

5.28 Patient Zone

Is the immediate space surrounding the patient that may be touched by the patient and may also be touched by the health care worker.

5.29 Peripheral Intravenous Cannula

Is a short, flexible hollow plastic tube or cannula containing a needle or introducer, into a peripheral vein to provide access to the vascular circulation, for the administration of fluids and medications (RCN 2010).

5.30 Phlebitis

Inflammation of a vein; may be accompanied by pain, erythema, oedema, streak formation and or palpable cord along the tract of a catheterised or recently catheterised vein, rated by a standard scale (RCN 2010).

5.31 Point of care

Is exactly where the care action takes place and is defined as the place where the three elements come together: the patient, the healthcare worker and care or treatment involving contact with the patient or his or her surroundings (WHO 2009).

5.32 Positive Pressure

is the constant even, force within the lumen of a catheter that prevents blood reflux; achieved by clamping while injecting (RCN 2010).

5.33 Proximal

Closest to the centre or midline of the body or trunk, or nearer to the point of attachment; the opposite of distal (RCN 2010).

Registered Midwife

Is a midwife whose name is entered in the midwives division of the register of nurses and midwives (NMBI 2014).

5.34 Registered Nurse

Is a nurse whose name is entered in the in the nurses division of the register of nurses and midwives (NMBI 2014).

5.35 Scope of Practice

Is the range of roles, functions, responsibilities and activities which a registered nurse or registered midwife is educated, competent and has the authority to perform (NMBI 2015).

5.36 Standard Precautions

Standard Precautions are infection prevention and control measures aimed at interrupting the route of transmission in order to protect staff and patients from contact with potentially infectious body fluids. Refer to Health Service Executive Hospital Group South/South East Network Waterford, Wexford, Carlow/Kilkenny and South Tipperary Standard Precautions Policy (current edition).

5.37 Successful Intravenous Placement

Is an IV attempt that results in the ability to flush Normal Saline 0.9% without the development of pain or swelling at the insertion site and subsequent enable use of the IV for medical care (Fields et al. 2014).

5.38 Venepuncture

Is the introduction of a needle into a vein to obtain a blood sample for haematological, biochemical or bacteriological analysis – also known as phlebotomy, venesection, drawing or taking blood (Weller 2009).

Abbreviations

AHR	Alcohol Hand Rub
ANTT	Aseptic Non Touch Technique
CDC	Centres for Disease Control and Prevention
CDU	Central Decontamination Unit
CIT	Community Intervention Team
CNM	Clinical Nurse Manager
CMM	Clinical Midwife Manager
CRBSI	Catheter-Related Bloodstream Infection
HCA-BSI	Healthcare Associated Bloodstream Infection
HSE	Health Service Executive
IV	Intravenous
Medical Practitioner	For the purpose of this guideline Medical practitioner refers to medical, surgical and anaesthetic practitioners
MHRA	Medicines and Healthcare Products Regulatory Agency
NMBI	Nursing & Midwifery Board Ireland
ONSD	Office of the Nursing Services Director
PPE	Personal Protective Equipment
PVC	Peripheral Vascular Catheter /Cannula
VIPS	Visual Infusion Phlebitis Score

6 Roles and Responsibilities

6.1 Responsibilities of all healthcare practitioners undertaking Peripheral Intravenous Cannulation

6.1.1 Comply with SLGH Guideline for Undertaking Peripheral Intravenous Cannulation in Adults and procedures therein, when undertaking these clinical skills

6.1.2 Be competent in the clinical skill of peripheral intravenous cannulation and the equipment specific to the procedure.

6.1.3 The practitioner must sign off that he/she has read, understood and agree to adhere to the SLGH Guideline for undertaking Peripheral Intravenous Cannulae in Adults.

6.1.4 Be familiar and comply with this organisation's infection prevention and control, health and safety procedures and risk management policies as they apply to peripheral intravenous cannulation.

6.1.5 It is the responsibility of all healthcare employees involved in the insertion of peripheral intravenous cannulae to check if the patient has a latex allergy. Ensure that non-latex equipment and products (e.g. tourniquet, IV Cannulae, PPE- gloves), are utilised for identified latex allergic patients.

6.1.6 Develop and maintain competence in peripheral intravenous cannulation specific to the needs of the service and patient group.

6.1.7 It is the responsibility of all practitioners to keep up to date with any advances in practice and acknowledge any limitations of competence and / or any limitations in relation to resources within the clinical environment.

6.1.8 The practitioner must endeavour not to puncture the skin more than twice whilst performing peripheral intravenous cannulation. If unsuccessful after two attempts, it is recommended that another suitably trained practitioner perform the intravenous cannulation procedure. The peripheral intravenous cannulation procedure is outlined in section 7.12.

6.1.9 In order to maintain competence it is recommended that the practitioner should undertake the practice of peripheral intravenous cannulation on a regular basis thereby maintaining a high level of skill through regular practice. Essentially, the practitioner is accountable for ensuring that his/her skill and competence is maintained.

6.1.10 It is also important to keep up to date with changes in best practice and keep abreast of equipment utilised for the procedure.

6.1.11 To accept personal responsibility and accountability for undertaking the procedure of peripheral intravenous cannulation.

6.1.12 In order to perform intravenous cannulation safely the practitioner must have basic knowledge of the following:

- The relevant anatomy and physiology
- Selection of a venous site and clinical assessment to choose the appropriate vein
- Hand hygiene and personal protective equipment
- Safe management and disposal of sharps
- Risks associated with the transmission of blood borne viruses
- Choosing equipment e.g. type of PVC required
- The peripheral intravenous cannulation procedure
- Maintenance of a peripheral intravenous cannula
- The potential problems and complications and the appropriate action to prevent and treat these complications
- Removal of a peripheral intravenous cannula
- Documentation.

6.2 Responsibility of the Clinical Nurse/Midwife Manager

6.2.1 It is the responsibility of the Clinical Nurse/Midwife Manager to ensure that nurses and midwives working with adults who are undertaking peripheral intravenous cannulation fulfil the following required criteria;

6.2.2 **Criteria for Nurses and Midwives commencing the Skill of Peripheral Intravenous Cannulation**

6.2.2.1 Be registered on the live register of nurses and midwives maintained by the NMBI or as a pre-registration nurse during their internship period of the undergraduate nursing registration programme.

6.2.2.2 Be employed by the Health Services Executive.

6.2.2.3 Hold a certification in Hand Hygiene within the last one to two years either from HSELanD Hand Hygiene Module or locally approved training.

6.2.2.4 Hold a certification in Aseptic Non Touch Technique from HSELanD.

6.2.2.5 Have successfully completed and hold a certificate in Intravenous Administration of Medications in advance of proceeding to undertake the skill of peripheral intravenous cannulation.

The Pre-Registration undergraduate BSc General Nursing student during the internship period must comply with the SLGH Policy for the Administration of Intravenous Medications and have undertaken education and training for the administration of intravenous fluids without additives via the peripheral route, for the purpose of Administration of 0.9% Sodium chloride (NaCl) flush, at the point of insertion of a peripheral intravenous cannula).

6.2.2.6 Be employed in an area where venepuncture and/or peripheral intravenous cannulation is required to enhance the patient's journey and service provision.

6.2.2.7 Be approved by their Clinical Nurse/Midwife Manager, Nurse Practice Development Facilitator or Director of Nursing/Midwifery as an appropriate person to expand their practice, to include venepuncture and/or peripheral Intravenous Cannulation.

6.2.2.8 Have undertaken the theoretical component of the eLearning Module for Venepuncture and Peripheral IV Cannulation and successfully completed the Self Assessment Components online via www.hseland.ie for both skills. The nurse/midwife must have documented evidence of a 'Pass' on the online Self Assessments Tests for both Venepuncture and Peripheral IV Cannulation before attending the Combined Venepuncture and Peripheral IV Cannulation Training Programme at St. Luke's General Hospital Kilkenny.

6.2.2.9 Have successfully completed the Combined Venepuncture and Peripheral IV Cannulation Training Programme at St. Luke's General Hospital Kilkenny (Refer to Appendix I).

6.2.2.10 Have undertaken a minimum of five successfully Clinical Supervised Practice Assessments in each skill (Refer to Appendix II and Appendix III) and obtained a Certificate of Competency achievement (Refer to Appendix V) demonstrating competence for independent practice in venepuncture and peripheral intravenous cannulation. This must be undertaken within 12 weeks of undertaking the SLGH Combined Venepuncture and Peripheral IV Cannulation Training Programme.

6.2.2.11 Accept personal and professional responsibility and accountability for undertaking venepuncture and/or peripheral intravenous cannulation in accordance with this guideline.

6.2.3 **Criteria for Nurses and Midwives who have successfully undertaken a Venepuncture and/or Peripheral Intravenous Cannulation Programme and practice the skill of Venepuncture and/or Peripheral Intravenous Cannulation in another employment.**

To preclude unnecessary replication for nurses and midwives who are newly employed in SLGH the following steps are necessary prior to undertaking venepuncture and or peripheral intravenous cannulation.

6.2.3.1 Provide documentary evidence that they have completed a training programme, were deemed competent and have maintained their competency prior to their change of employment.

6.2.3.2 Become familiar with SLGH guidelines and procedures related to venepuncture and/or peripheral intravenous cannulation and professional guidelines.

6.2.3.3 Undertaken a minimum of five successfully Clinical Supervised Practice Assessments in each skill (Refer to Appendix II and Appendix III) demonstrating competence for independent practice in venepuncture and peripheral intravenous cannulation.

6.2.3.4 Submit documentary evidence of completion of an education and training programme, HSELand Certificates for both skills and successful Clinical Supervised Practice Assessments in each skill to the Nurse Practice Development Co-ordinator prior to undertaking the practice of Venepuncture and Peripheral Intravenous Cannulation.

6.2.4 Nurses and midwives whose education and training is not aligned to SLGH criteria must undertake all the required steps of the skills pathway.

6.2.5 It is the responsibility of the clinical nurse or midwifery manager or line manager to ensure the staff within their area of responsibility have access to, read and sign this guideline.

6.2.6 The clinical nurse or midwifery manager or line manager must maintain an updated list of all staff that are competent in peripheral intravenous cannulation in their clinical area.

6.2.7 **Role and Responsibilities of the Clinical Practice Assessor for Peripheral Intravenous Cannulation**

6.2.7.1 The clinical practice assessor should be a Registered Nurse/Midwife who is competent in venepuncture and peripheral intravenous cannulation and is approved by the Nurse Practice Development Facilitator/Director of Nursing/Midwifery to undertake the assessment:

6.2.7.2 The clinical practice assessor must be competent in the clinical skills to facilitate assessment and have knowledge of local policies and the assessment process required for venepuncture and/or peripheral intravenous cannulation procedure.

6.2.7.3 The clinical practice assessor must supervise and assess the nurse/midwife undertaking each procedure in the clinical area and complete the Record of Supervised Practice and Competence Assessment (Refer to appendix II, appendix III and appendix IV). The Record of Supervised Practice and Competence Assessments must be signed on each assessment by the clinical practice assessor. The Record of Supervised Practice and Competence Assessments must be completed within twelve weeks of undertaking the SLGH Combined Venepuncture and Peripheral IV Cannulation Training Programme.

6.2.7.4 The clinical practice assessor must have undertaken a preceptorship education programme or an equivalent qualification to support the nurse/midwife to undertake the required number of supervised clinical practice assessments.

7 Procedural guideline for Peripheral Intravenous Cannulation in Adults

7.1 Indications for Use of a Peripheral Intravenous Cannulation

7.1.1 To facilitate intravenous access in an emergency situation or where required as a precautionary measure.

7.1.2 To facilitate intravenous access prior to an elective surgical or other procedure.

7.1.3 To provide intravenous hydration and/or correction of Pre-existing dehydration or electrolyte imbalance.

7.1.4 To administer prescribed intravenous medication (intermittent, continuous or Bolus medications).

7.1.5 To achieve high and predictable medication levels e.g. antibiotics in life threatening infections.

7.1.6 To administer blood components and blood products.

7.1.7 To administer a prescribed opaque medication and/or a diagnostic reagent to assist with diagnosis.

7.1.8 To provide parenteral nutrition when the central route is unavailable.

7.1.9 For patients who cannot tolerate fluids or medication by mouth e.g. if vomiting or unconscious, solutions and medication may be administered parenterally.

7.1.10 Where medication is broken down in, or not absorbed from the gastrointestinal tract e.g. insulin.

7.1.11 For patients whose gastrointestinal tract has to be rested e.g. patients with non-functioning or inadequately functioning gastrointestinal tracts, or following gastrointestinal surgery.

7.1.12 When an injection is required but the injection into the skin or muscle would cause pain or trauma.

7.1.13 When the medication is not available in oral formulation.

7.2 Considerations for the Insertion of a Peripheral Intravenous Cannula

7.2.1 Peripheral intravenous cannulation is an invasive and traumatic procedure and should only be undertaken where there is a definite clinical indication.

7.2.2 Peripheral intravenous cannulation procedure should not be routinely used for blood sampling but blood can be taken immediately following insertion (INS 2006, Dougherty 2008).

7.2.3 A clinical assessment of the adult should be undertaken prior to the insertion of a peripheral intravenous cannula.

7.2.4 Peripheral intravenous cannulation should be carried out as close to the time of use to reduce the risk of accidental dislodgement and related complications.

7.2.5 Where peripheral intravenous access is poor and cannulation access is difficult, alternative methods of access should be considered and discussed with the appropriate medical team.

7.2.6 Infusion of markedly irritant or vesicant substance (e.g. total parenteral nutrition or some cytotoxic drugs) are best administered via a midline catheter or a peripherally inserted central catheter (PICC) (RCN 12010, Dougherty & Lister 2015).

7.2.7 A peripheral intravenous cannula should not be sited in close proximity to another cannula.

7.2.8 Peripheral intravenous cannulation is regarded as a minor surgical procedure and is carried out with a high standard of aseptic non touch technique including hand hygiene, site preparation and maintenance.

7.3 Informed Consent

7.3.1 Informed verbal consent should be obtained from the patient prior to the procedure where possible (Refer to HSE National Consent Policy 2014).

7.3.2 If the patient does not speak English, arrangements should be made to ensure the procedure is understood and the consent is valid. The patient should be given adequate information and explanation. Where necessary use the hospital approved Interpretative Services.

7.4 Psychological, Pharmacological and non-Pharmacological Methods of Pain Relief

7.4.1 Pre-existing anxiety or phobia associated with peripheral intravenous cannulation may be reduced by good communication skills, diversion, distraction and relaxation techniques (Dougherty 2008). Patient's previous experiences with PVC should also be taken into consideration and measures applied that previously relieved pain and anxiety (Dougherty 2011).

7.4.2 How the procedure is performed may have a direct bearing on the patient's response to peripheral intravenous cannulation. A skilled practitioner employing a good technique will reduce the amount of pain experienced by the patient (Dougherty 1996).

7.4.3 Topical Anaesthetic Agents

7.4.3.1 The need for a topical anaesthetic agents prior to the procedure should be considered on an individual basis, must be **prescribed** and used in accordance with manufacturer's instructions, especially for those individuals who have had previous bad experience or suffer from needle phobia, both of which may induce 'anticipatory' feelings of increased distress and anxiety before peripheral IV cannulation is carried out (Valdovinos et al 2009, McGowan 2014).

7.4.3.2 Check the patient's Drug Sensitives/Allergy Status prior to the application of a topical anaesthetic agents.

7.4.3.3 Topical Anaesthetic Agents such as Ametop Gel and Emla Cream produce numbness of the skin and been proven to reduce the pain experienced during the peripheral intravenous cannulation procedure (Dougherty, 2008).

Details of topical anaesthetic agents are:

- **Ametop Gel** Consists of: Amethocaine 4% Gel. Indications: All adults. Application Time: A minimum of 30 minutes prior to the procedure. Side Effects: Redness, swelling & itchiness.
- **Emla Cream** (Eutectic mixture of local anaesthetics). Consists of: lidocaine and prilocaine 5% Cream. Indications: All adults. Application Time: A minimum of one hour prior to the procedure. Side Effects: Redness, swelling & itchiness.

7.4.3.4 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).

7.4.3.5 Single use preparations should be used.

7.5 Vein Selection in Adults

7.5.1 Choosing the correct vein is important. In adults the assessment includes a visual inspection of both upper limbs, followed by palpation of the veins to be used (Dougherty 1996).

7.5.2 Veins that should be considered for Peripheral IV cannulation are those found on the dorsal and ventral surfaces of the upper limbs including the metacarpal, basilic and cephalic veins (Griffiths 2007, Dougherty 2008, and Scales 2008). The metacarpal veins on the dorsum of the hand are easiest to visualise but are more liable to block, difficult to stabilise and prone to infusate or medication induced vessel damage (Refer to Appendix VII).

7.5.3 Veins in the lower limb extremities should not be routinely used in adults for peripheral cannulation in adults due to the risks of emboli and thrombophlebitis (RCN, INS 2011)). Patients with diabetes must not be cannulated in their feet (RCN 2010). Veins in the lower limbs should only be used for the short term or in emergencies. Insertion of a peripheral intravenous cannula into the foot or in the leg are not very common sites and should only be undertaken by suitably trained/ experienced medical practitioners when all other sites are inaccessible.

7.5.4 The antecubital fossa veins should be reserved for emergency situations such as during resuscitation.

7.5.5 The patient's non-dominant fore arm should be selected in the first instance wherever possible.

7.5.6 Site selection should be routinely initiated in the distal area of the upper extremities; subsequent cannulation should be made proximal to the previously cannulated site (Weinstein 2007). Selecting the distal areas of the upper extremities allows for further attempts above the selected vein which will not have been impeded. These are outlined below in Table.1.

7.5.7 Cannulation should be avoided on bruised, painful or infected skin.

7.5.8 Cannulation should be avoid areas of flexion (Dougherty and Watson 2008) as this may compromise flow and increase cannula movement which increases the risk of mechanical phlebitis, infiltration and infection.

7.5.9 Cannulation should be avoided in an arm affected by a cerebro vascular accident.

7.5.10 Cannulation should be avoided in an arm affected by lymphoedema or where a patient has undergone mastectomy and/or axillary node dissection/radiotherapy.

7.5.11 The dorsum of the hand should be used in patients with chronic renal failure. The use of the anterior (ventral) forearm veins (particularly the cephalic veins) is not recommended in patients with impending need for dialysis in whom preservation of upper extremity veins is needed for fistula implantation. If this is unavoidable seek medical opinion prior to the procedure and ensure the decision is documented. When venepuncture of the arm veins is necessary, sites should be rotated.

7.5.12 The vein should feel bouncy, refill when depressed, should be straight and free of valves to ensure easy advancement of the cannula (Dougherty & Lister 2008).

Table 1 Summary of possible veins that may be used for peripheral Intravenous cannulation in adults

Veins	Therapeutic Uses	Comfort, convenience, safety for patient	Access for practitioner
Cephalic	Large vein, accommodates large gauge cannula – good haemodilution.	• If forearm site is used, bone acts as a splint • Care needed to avoid hitting the radial nerve	Visible, good access
Basilic	Large vein, accommodates large gauge cannula – good haemodilution.	• If forearm site is used, bone acts as a splint • Haematoma may occur if arm is flexed, and on removal	• Visible • Tends to roll easily (difficult to stabilise during cannulation) • Has many valves – may cause hindrance • Position may make vein difficult to access and observe
Antecubital (median cephalic, median basilic, median cubital)	Large vein, accommodates large gauge cannula – good haemodilution.	• Requires splinting – difficult over a joint and any movement can dislodge the cannula • Vessels, tissues and nerves easily damaged	Palpable and well supported by tissue
Median ante brachial	Allows for good haemodilution.	• Requires splinting – difficult • Discomfort on insertion • Infiltrates easily • Vessels, tissues and nerves easily damaged	• Tends to roll
Metacarpal	Small veins and only accommodate a small gauge cannula – for non-irritating fluids, sort term use.	• Bones act as splint • Impairs use of hand • Inflames easily • May be more painful • Are fragile and poorly supported in elderly • Thin walls	• Enables successive access above previous site • Visible, good access

Source: HSE/ONMSD (2017) Guiding Framework for Education, Training and Competence Validation in Venepuncture and Peripheral Intravenous Cannulation for Nurses and Midwives.

7.6 Clinical Assessment

A clinical assessment should be carried out by the healthcare professional prior to the peripheral intravenous cannulation procedure.

A four step approach to the clinical assessment is outlined as follows:

Check

- The indication for peripheral intravenous cannulation
- If intravenous medication or fluids could be given by any other route i.e.
    - Is this the last dose of an antibiotic?
    - Is the patient on oral fluids or diet?
- Purpose, duration and rate of the intravenous infusion
- The clinical condition (acute/chronic/emergency)of the patient
- Type and volume of intravenous fluid or medication to be administered via a vein
- Location and length of the vein
- Condition of the vein(visual and palpation)
- Area is warm prior to cannulation procedure (veins constrict if cold, making the procedure more difficult)
- Allergies to medications, topical anaesthetic agents, dressings or plasters
- For needle phobia
- Previous history of difficult peripheral cannulation procedures
- Factors relating to individual patients, i.e. obese, malnutrition, older patient's due to fragile veins
- Patient's preference about the site, however vital to check both arms
- History of blood borne viruses,
- History of bleeding disorders or if receiving anticoagulant therapy or long term steroids.

Choose

- A suitable vein for peripheral cannula insertion, avoiding arteries and nerves
- Most distal aspect of the vein
- Non-dominant forearm is preferred
- Appropriate equipment to undertake procedure
- Appropriate topical anaesthetic agent (if required and as prescribed).

Avoid

- Hard, sclerosed, fibrosed, knotty, thrombosed veins or previous cannulation sites/obvious scarring from previous intravenous drug use (track marks)
- Sites where circulation is impaired
- Areas with increased subcutaneous fat
- Areas of flexion and bony prominences
- Sites with existing intravenous infusions in situ
- Sites that may have require peripheral intravenous central catheter (PICC) insertion or arterial monitoring
- Valves in vein (if visible or palpable)

Do not Use Limb

- with obvious infection or bruising
- with a fracture/ graft
- with an arteriovenous (AV) fistula
- affected by a cerebro vascular accident
- affected by lymphoedema or where axillary lymph node clearance has taken place, for example post mastectomy
- affected with burns

7.7 Types of Cannulae used for Adults

7.7.1 Peripheral intravenous cannulae range in type and size depending on purpose. The correct size cannula will help to prevent damage to the intima of the vein, ensure adequate blood flow and minimise risk of vascular complications.

7.7.2 Usually the smallest size (gauge) for the prescribed therapy is chosen to facilitate better flow and minimise trauma (RCN 2010, Scales 2005). Small veins will not accommodate large volumes or irritant solutions, therefore the purpose of the cannula will determine the appropriate type and size.

7.7.3 The largest PVC (14-16 gauges) should be used for infusions of viscous fluids and for rapid infusions.

7.7.4 Smaller sizes (18-20 gauges) suffice for crystalloids.

7.7.5 The smallest PVCs (20-24 gauges) are adequate for intermittent administration of medications, except those to be given by rapid infusion.

7.7.6 The practitioner should be familiar with the types of cannulae used in SLGH (Refer to Appendix VIII).

7.7.7 The use of a short extension set attached to the PVC is recommended (SARI 2010).

7.8 Equipment

The equipment required should be based on the assessment of the patient and the purpose of the peripheral intravenous cannulation.

<table>
<tr><th colspan="2">List of Equipment for Peripheral Intravenous Cannulation in Adults</th></tr>
<tr><td>• A clinically clean intravenous tray with integrated sharps container</td><td>• Alcohol hand rub /gel</td></tr>
<tr><td>• Sterile dressing pack or equivalent to create a sterile field</td><td>• Clean single use disposable Tourniquet</td></tr>
<tr><td>• Disposable non-sterile sheet (optional in case of blood spillage)</td><td>• **Intravenous cannula (choose size appropriately)</td></tr>
<tr><td rowspan="4">• *Personal Protective Equipment (well fitting, powder free, non-sterile gloves, protective plastic apron, safety goggles/visor/mask with eye shield)</td><td>• IV Accessories (e.g. IV needless connector/Leur lock/ IV Cap/Bung)</td></tr>
<tr><td>• ***Short extension set primed with sterile Sodium Chloride (NaCl 0.9%)</td></tr>
<tr><td>• 10ml syringe with sterile Sodium Chloride (NaCl 0.9%) flush</td></tr>
<tr><td>• Sterile gauze swabs (to absorb blood spillage)</td></tr>
<tr><td>• Skin disinfectant:
Single use 2% Chlorhexidine in 70% isopropyl alcohol swab
Continue to use 70% isopropyl alcohol for patients who have an allergy to chlorhexidine</td><td>• Sterile transparent semi-permeable adhesive dressing complete with sterile adhesive tape to prevent dislodgement and date of insertion’ sticker</td></tr>
<tr><td rowspan="2">• Topical anaesthetic agent (if prescribed) Single use</td><td>• Sterile waterproof plaster (in case of unsuccessful attempt)</td></tr>
<tr><td>• Yellow waste bag for blood contaminated non sharp clinical waste</td></tr>
<tr><td colspan="2">* As per Standard Precautions the use of plastic apron, and/or face protection should be assessed by each healthcare professional based on the risk of blood splashing or spraying during the procedure.</td></tr>
<tr><td colspan="2">**Range and type of equipment may vary depending on the purpose for the cannulation (e.g. an intravenous therapy solution and stand if commencing intravenous therapy).</td></tr>
<tr><td colspan="2">***The use of a short extension set attached to a PVC can also reduce complications and is recommended (Sari 2009 p20).</td></tr>
</table>

NOTE:
0.9% Sodium Chloride must be checked by two practitioners, this includes: Two registered nurses/midwives or a registered nurse/midwife and a doctor/pharmacist or a registered nurse/midwife and a third or fourth year BSc general nursing student.

7.9 Prior to Procedure: Preparation in designated clean clinical area

7.9.1 Confirm indication for the procedure

7.9.2 Perform hand hygiene as per 5 moments.

7.9.3 Preparation should be carried out in designated clean area.

7.9.4 Collect the appropriate equipment necessary for the procedure and inspect its integrity including expiry dates.

7.9.5 Disinfect a clean clinical tray and allow to dry.

7.9.6 In undertaking the procedure, it is important that only the equipment required is taken to the bedside and set up immediately prior to the procedure. This is to prevent cross contamination from occurring.

7.9.7 The peripheral intravenous cannulation procedure follows aseptic principles, using a non-touch technique. This means that the following key parts must only be touched by sterile items:

- All parts of the cannula except the outer protective shield and outer housing section
- Tip of leur lock
- Tips of extension set
- Tip of syringe
- Shafts and tips of needles (if used)
- Section of gauze that is in contact with the cannula
- Side of dressing in contact with cannula.

7.10 At the bedside: Patient Zone

7.10.1 Perform hand hygiene as per 5 Moments (WHO 2009). .

7.10.2 Confirm patient's identification. Check patient's name, date of birth and medical record number against the patients' identification bracelet, if the patient is an inpatient. In an outpatient situation, ascertain the patient s' identity by verifying their name, date of birth and address.

7.10.3 Explain the procedure to the patient, and give the patient the opportunity to voice any concerns, express any preferences or ask any questions (Trim 2005, Dougherty 1999).

7.10.4 It is the responsibility of the practitioner undertaking the procedure of peripheral intravenous cannulation, to provide information to the patient and family/significant others.

7.10.5 Where possible obtain informed verbal consent.

7.10.6 Check if the patient has any known allergies to medications, anaesthetic agents, latex, dressings or plasters.

7.10.7 Discuss pain relief (pharmacological and non-pharmacological methods). If pain relief is required an anaesthetic agent must be prescribed and applied at least one hour before the procedure. The anaesthetic agent should be removed prior to the procedure according to manufacturer's instructions.

7.10.8 Assist the patient to find a comfortable position. Ensure the patient is either sitting up in a well-supported position or lying on a bed or trolley. This will minimise injury to the patient / client in the event of a vaso-vagal episode during the procedure.

7.10.9 Establish the patients' venous history and any relevant changes in clinical status.

7.10.10 An appropriate insertion site should be selected (non dominant forearm if possible).

7.10.11 Visibly soiled skin should be cleaned with soap and water then allowed to dry.

7.10.12 Place a disposable non sterile sheet under the patients arm (optional).

7.10.13 Position and support the arm comfortably to optimise vein selection and minimise risk of arm movements on insertion.

7.10.14 Palpate the site to check for rebound elasticity – press lightly with two fingers and release.

7.10.15 Apply a single use disposable tourniquet (5/6cms above chosen site) and tighten slowly. The tourniquet should be tight enough to impede venous return while not affecting arterial flow. Do not leave on for longer than 1 minute.

7.10.16 Allow time for the veins to fill. If the vein is not easily identified, ask the patient to open/close fist and keep fist closed or place arm below heart level or the application of a warm single use compress.

7.10.17 Palpate the site to check for rebound elasticity – press lightly with two fingers and release.

7.10.18 Chose the appropriate vein.

7.10.19 Release tourniquet and leave it in position, ready to reuse.

Precautions when using a tourniquet
When applying a tourniquet to the upper arm on the chosen side, make sure it does not obstruct arterial flow. If the radial pulse cannot be palpated them the tourniquet is too tight (Weinstein and Plumer 2017). The position of the tourniquet may be varied, for example, if the vein in the hand is to be used it may be placed on the forearm. Do not allow the tourniquet to be applied for more than **1 minute**. Extended application of the tourniquet may result in local stasis and possible haematoma formation. If a tourniquet must be applied for the preliminary vein selection, it should be released and **reapplied after a 2 minute rest period** (Clinical and Laboratory Standards Institute 2007).

7.11 Preparation of Sterile Field and Site

7.11.1 Perform hand hygiene as per 5 moments (WHO 2009).

7.11.2 Don non-sterile disposable, appropriate size gloves. Additional PPE e.g. apron, mask and eye protection may be required following risk assessment of an increased exposure to blood.

7.11.3 Prepare your equipment, the sterile dressing, appropriate cannula for selected vein and other sterile items maintaining a sterile field using an aseptic non-touch technique (ANTT).

7.11.4 Using 0.9% Sodium Chloride 10mL flush syringe, prime the extension set.

7.11.5 Disinfect the patient's skin and the selected vein for at least 30 seconds using 2% chlorhexidine gluconate in 70% isopropyl alcohol back and forth strokes with friction on an area of 4-5cms and allow to dry (Royal Marsden 2015). Dispose of used skin disinfection wipes appropriately by placing in the clinical waste discard bag.

7.11.6 Do not touch or re-palpate the site. If re-palpation is required, hand hygiene and skin disinfection must be performed again.

7.11.7 The IV cannula needle guard should be removed and the device inspected for integrity (ICNA 2001, Dolan and Dougherty 2000, Dougherty 1999).

7.11.8 Reapply the disposable tourniquet (ensure a rest period of 2 minutes has elapsed).

7.12 Cannula Insertion

7.12.1 Remove the needle guard and inspect the device for any faults (Dougherty & Lister 2015).

7.12.2 To facilitate a smooth entry, anchor the vein by applying manual traction on the skin a few centimetres below the puncture site with the non-dominant hand.

7.12.3 Hold the cannula between your thumb and index finger and use thumb to anchor the cannula hub.

7.12.4 Position the cannula facing bevel-upwards. Do not touch the cannula or the insertion site.

7.12.5 Insert the cannula directly above the vein, through the skin (angle at approximately 10 -30 degree depending on the depth of the vein).

7.12.6 When the cannula punctures the vein, observe for flashback of blood in the cannula chamber as appropriate.

7.12.7 Lower the angle between the cannula and the skin.

7.12.8 Advance the cannula a further 2mm along the lumen of the vein.

7.12.9 Withdraw the introducer slightly with the dominant hand and a second flashback of blood will be seen along the shaft of the cannula (Dougherty & Lister 2015).

7.12.10 Slowly advance the cannula fully into the lumen of the vein.

7.12.11 Gently pull the introducer backwards, while holding the cannula in position.

7.12.12 Loosen and release the tourniquet whilst supporting the device in situ.

7.12.13 Hold the sterile gauze by one corner and place under the cannula hub to absorb blood spillage. Ensure only section of gauze that is sterile is in touch with hub.

7.12.14 Apply digital pressure to the vein above the cannula tip and remove the stylet gently, activating the needle safety device.

7.12.15 Dispose of all sharps in the sharps container at point of care.

7.12.16 If blood collection is required at this stage, attach the appropriate safe blood collection system and adhere to ANTT and venepuncture as per SLGH policy. Blood samples required for analysis must be drawn before flushing the cannula with saline. After any flushing or medication has been administered, the cannula may no longer be used for blood collection.

7.12.17 Attach primed short extension set to the cannula hub to minimise increased risks of mechanical phlebitis associated with direct cannulae access.

7.12.18 Discard the blood contaminated gauze into the yellow healthcare risk waste bag.

7.12.19 Secure and anchor each wing of the IV cannula with a strip of sterile narrow adhesive tape to prevent dislodgement (only sterile tapes should be used beneath the dressing). The sterile adhesive tape should not be placed directly on the PVC-skin junction site (Heckler 2005). The device should be stabilised in a manner that does not obscure the visual assessment and monitoring of the PVC insertion site and surrounding tissue, that does not impede the delivery of the prescribed therapy, and that is acceptable to the patient.

7.12.20 The cannula insertion site must be covered with a sterile transparent semi-permeable IV cannula dressing. Placement of the dressing should be in accordance with the manufacturer's guidelines.

7.12.21 Secure a 'Date of Insertion' sticker (supplied with PVC dressing) to the outside of the cannula dressing, ensuring that you have the date and time of insertion documented.

7.12.22 In some cases it may be necessary to use sterile gauze dressings e.g. if patient allergic to transparent dressing; however the sterile gauze dressings must be removed to visually inspect the insertion site at least 12 hourly or with any intervention involving the PVC.

7.12.23 Aspirate to check for blood flashback.

7.12.24 Flush the cannula with sterile Sodium Chloride 0.9% using a push pause technique (pulsatile) and ending with a positive pressure (Dougherty & Lister 2015) to confirm patency.

7.12.25 Observe the site for signs of swelling or leakage and ask the patient if they are experiencing any discomfort or pain.

7.12.26 Remove the disposable sheet, gloves and PPE (if applicable) and discard in appropriate waste bag.

7.12.27 Perform hand hygiene as per 5 Moments.

7.12.28 Document date and time of insertion, the site and size of cannula, number of attempts and sign in healthcare notes or care plan (Dougherty & Lister 2015).

7.12.29 Bandages are not recommended for the additional securement of peripheral intravenous cannula as they make observation of the insertion site more difficult.

7.12.30 It may be appropriate to use bandages for additional securement in patients who are likely to dislodge or at risk of self removing their intravenous cannula.

7.12.31 If bandaging is deemed necessary, a light 'conforming'-type bandage should be used and not a crepe bandage. The limb should be bandaged lightly to prevent pressure on the vein and the bandage removed every 12 hours and every time an intravenous medication is administered, to allow inspection of the site (Nicol 1999).

7.12.32 Bandages should not be applied when vesicant medications are being administered.

7.12.33 In the event of unsuccessful cannulation of the vein, withdraw the cannula from the puncture site and apply pressure with a sterile swab.

7.12.34 Prior to subsequent attempts at IV cannulation it is the responsibilities of the individual practitioner to risk assess the difficulty of further attempts against their own competence and experience. If the practitioner anticipates the difficulty level to be beyond their scope of practice, then referral to more experienced, competent practitioners should be made.

7.12.35 In order to prevent unnecessary trauma to the patient **only two attempts** should be made by each practitioner at peripheral intravenous cannulation. A new cannula should be used at each attempt.

7.13 After care

7.13.1 Inform the patient of potential complications and advise to report same immediately to nursing or medical staff.

7.13.2 Give the patient an IV cannula care information leaflet. It is important that the patient is educated regarding hand hygiene and the importance of keeping the PVC site dry and clean.

7.13.3 If further contact with the patient or the patient's surrounding occur hand hygiene must be performed as per 5 Moments.

7.13.4 Ensure the patient is in a comfortable position and reassure.

7.14 Post Procedure

7.14.1 Bring IV tray with used items to the designated utility area. Risk assess the need for disposable gloves e.g. contamination of equipment.

7.14.2 Dispose of healthcare risk and non risk waste appropriately.

7.14.3 Decontaminate the clinical tray using one of the following options;

- Place used IV tray in the Central Decontamination Unit container for collection and decontamination or
- Clean and disinfect the IV tray with detergent/disinfectant as per HSE/SE Decontamination Policy

7.14.4 Remove gloves (if used) and apron and perform hand hygiene.

7.14.5 Arrange for blood samples to be transported to the laboratory (where applicable).

7.14.6 All clinical incidents or close calls must be documented and reported promptly to the Clinical Risk Manager.

7.14.7 **It is recognised that in emergency situations, adherence to this policy may be compromised. In this case, all compromised devices should be replaced aseptically as soon as possible (SARI 2009).**

7.15 Documentation

7.15.1 Accurate documentation and record keeping of peripheral intravenous cannula insertion must be maintained for all in-patients in the Peripheral IV Cannula Insertion Management & Removal Record in the NEWS Adult Patients Observation Chart (Refer to Appendix XI).

7.15.2 Day case patients and patients attending the admission areas must have a record of IV cannulae insertion and removal documented in own departmental documentation.

7.15.3 Documentation specific to the insertion of a peripheral intravenous cannula should include the following details:

- Date and time of cannula insertion
- Site of the insertion
- Size of cannula
- Adherence to aseptic technique
- Name of practitioner inserting the device.

7.15.4 If attempts at IV cannulation exceed one attempt, the number of cannulation attempts should also be recorded, the tolerance of the procedure and management of complications should be documented in the patient's medical/nursing records.

7.16 Care and Maintenance of an Indwelling Peripheral Intravenous Cannula site

7.16.1 Ensure that the cannula is in correct position and a sterile semi-permeable transparent is intact.

7.16.2 Ensure that the PVC entry site is visible through the dressing.

7.16.3 The site should be kept clean and dry at all times. The dressing should only be changed if it becomes loose, wet or soiled. ANTT should be used for dressing changes (RCN 2010).

7.16.4 Use Visual Infusion Phlebitis Score (VIPS) Appendix X to inspect the cannula site on each shift (12 hourly) for signs of tenderness, swelling, inflammation, discharge or thrombosis (INS 2011.

7.16.5 Ensure a single lumen primed extension set is applied to the cannula and clamped when not in use.

7.16.6 Clean the hub of the extension set with 2% Chlorhexidine gluconate solution in 70% isopropyl alcohol product and air dry prior to flushing the cannula.

7.16.7 Flush the cannula with sterile 0.9% Sodium Chloride (0.9% NaCl) solution daily or before and after each drug administration or infusion and ensure positive pressure is maintained by clamping the extension set prior to flushing the final 1 ml of saline (RCN 2010).

7.16.8 The IV site must also be observed while:

- Bolus injections are administered
- IV flow rates are being checked or altered
- IV infusions /transfusion bags are being changed
- The patient is showering or washing
- Advise the patient on protecting the PVC while showering or washing

7.16.9 Advise the patient to protect the PVC before, during and after personal hygiene.

7.16.10 Inspect the PVC site on each shift for signs of tenderness, swelling, inflammation, discharge or thrombosis as per VIP Score (INS 2011).

7.16.11 Document inspection of the PVC site in the PVC Insertion, Management & Removal Record (Care Bundle) on the NEWS Observation Chart.

7.16.12 If there is a suspicion of an infected PVC insertion site

- Swab any exudates (if present) and send to the microbiology laboratory for culture and antimicrobial sensitivity.
- Remove the PVC (SARI 2010).
- Clean the insertion site with 2% Chlorhexidine gluconate solution in 70% isopropyl alcohol product.
- Notify medical team as treatment may be indicated. Blood cultures should be taken if the patient is systemically unwell (SARI 2010).
- Document findings and action taken in the nursing progress notes.
- Continue to observe PVC insertion site

Please Note: PVC must be re-sited only if clinically indicated and not routinely (Loveday et al. 2014)

7.17 Management of Potential Complications

7.17.1 Specific potential complications that can arise following the procedure include infiltration, extravasation, venous spasm, phlebitis, thrombophlebitis, haematoma, nerve injury, arterial puncture, embolism and needle stick injury. It is critical for the practitioner to detect and prevent complications arising and to treat as required. (Refer to Appendix IX for information on Complications).

7.18 Removal of the PVC

7.18.1 When a Peripheral Intravenous Catheter is no longer required it should be removed.

7.18.2 Removal of the peripheral intravenous cannula should be an ANTT procedure. The device should be removed carefully, using a slow steady movement and pressure should be applied until haemostasis is achieved. This pressure should be firm and not involve any rubbing movement.

7.18.3 The site should be inspected to ensure bleeding has stopped and should then be covered with a sterile dressing (INS 2010).

7.18.4 The cannula integrity should be checked to ensure the complete device has been removed (RCH 2010, INS 2011, Dougherty & Lister 2015).

7.18.5 Discard all sharps appropriately.

7.18.6 Monitor and observe the PVC site for a further 48 hours after device removal for post signs and symptoms of post infusion phlebitis.

7.18.7 Document the date and reason for PVC removal in the Peripheral IV Cannula Insertion Management and Removal Record.

7.18.8 If intravenous access is required following removal, an alternate site must be used.

7.19 Replacement of a Peripheral Intravenous Cannula

7.19.1 When adherence to aseptic technique cannot be ensured (i.e. when PVCs are inserted during a medical emergency), PVCs must be replaced as soon as possible (SARI 2010) and within 24hrs (RCN 2010).

7.19.2 If a PVC is removed due to a phlebitis score of 2 or more, observation of the cannulation site should continue to be monitored for further signs of phlebitis and infection. All resulting treatment and actions taken must be documented.

7.19.3 Assessment on Transfer of a Patient

Patients with a PVC inserted by a transferring hospital will require assessment of the cannula and the insertion site for inflammation, infiltration, extravasation, infection, leaking or pressure of the cannula on the surrounding tissue, signs of phlebitis as per VIP Score (Appendix X) upon arrival. Review supporting documentation. Removed and re-sited as indicated.

7.19.4 All peripheral intravenous cannula devices should be removed prior to the patient's discharge from hospital. (Refer to Exception section 7.18.14).

7.19.5 **Exception**

Patients being discharged to the care of the Community Intervention Team (CIT) may have a functional PCV left in place under the following conditions;

- The PVC is clinically indicated (e.g. PVC required for continuing administration of intravenous therapy in the community setting).

- The decision to leave PVC dwelling beyond discharge to CIT should depend on the practitioner's clinical assessment of PVC site for skin integrity, signs and symptoms of infection, phlebitis, infiltration or mechanical complications and consideration for the length and type of prescribed intravenous therapy. This assessment must be clearly documented. The Visual Infusion Phlebitis Score (VIPS) must also be recorded.

- Remove a PVC which has been in situ for ≥ 72 hrs. PVCs beyond this timeframe should be re-sited prior to discharge to the CIT.

- An intact, clean and dry, adherent transparent semi permeable sterile dressing is in situ with date and time of PVC insertion clearly documented on dressing.

- Patient has received advice on the care of the cannula. The patient should be encouraged to immediately report any discomfort such as pain, burning, swelling or bleeding.

- A patient information leaflet should be given to the patient.

- The Community Intervention Team must be informed that a PVC is remaining in situ on discharge and the date for removal is also documented on the transfer/discharge documentation to CIT.

- On discharge the management and removal of the peripheral intravenous cannula becomes the responsibility of the Community Intervention Team.

8 Implementation Plan

8.1 This guideline will be available to view on the Hospital Intranet Site/Clinical PPPGs. This guideline will be circulated to the Director of Nursing, Director of Midwifery, Senior Nurse Managers Team, Clinical Nurse/Midwifery Managers, Clinical Nurse Specialists, Advanced Nurse Practitioner, Clinical Director, Hospital Consultants, Radiology Services Manager, Clinical Risk Manager and Hospital Manager.

8.2 It is the responsibility of all hospital Consultants, Clinical Nurse Managers, and line managers to ensure that all healthcare staff in their area of responsibility undertake training appropriate to service requirements and in accordance with this practice guideline.

8.3 Each individual practitioner undertaking peripheral intravenous cannulation is responsible to practice independently and maintain competence.

9 Evaluation and Audit

9.1 Clinical Practice Assessors are responsible for monitoring compliance with the guideline on an ongoing basis.

9.2 The Clinical Nurse Managers undertake audit in accordance with the Peripheral Vascular Cannula Care Bundle Form (HPSC 2009) for ongoing care and management of Peripheral Intravenous Cannula in the general clinical areas.

9.3 Clinical Risk Management – A mechanism for recording, reviewing and acting on adverse peripheral intravenous cannulation incidents.

9.4 The content of this Guideline will be reviewed in 2 years from the date of approval.

10 Revision History

Date	Review Number	Section Number	Change/s
Oct 2018	5		**Practice Changes**
			Procedure section updated to comply with the National Guideline 2017
			Appendices IX updated Management of Potential Complications Appendices VI updated Skills Pathway Algorithm

11 References/Bibliography

- ANTT® Theoretical Framework for Clinical Practice V4.0 2015. Association for Safe Aseptic Practice (ASAP) www.ANTT.org.
- BNF (2015) British National Formulary. Available online at: https://www.medicinescomplete.com/mc/bnf/current/PHP8753-ametop.htm#PHP8753-ametop.
- Clinical and Laboratory Standards Institute (2007). Procedures for the collection of diagnostic blood specimens by venipuncture: Approved standard – Sixth Edition (CLSI Document H3-A6). Wayne, PA: Clinical and Laboratory Standards Institute.
- Department of Children and Youth Affairs (2011) Children First: National Guidelines for the Protection and Welfare of Children. Government Publications. Dublin.
- Department of Health & Children (2011) Strategic Framework for Role Expansion of Nurses and Midwives: Promoting Quality Patient Care Department of Health. Dublin.
- Department of Health UK (2011) *High Impact Intervention – Peripheral intravenous cannula care bundle*. Department of Health, London. Retrieved from http://webarchive.nationalarchives.gov.uk/20120118164404/http://hcai.dh.gov.uk/files/2011/03/2011-03-14-HII-Peripheral-intravenous-cannula-bundle-FIN%E2%80%A6.pdf on 31 March 2016.
- Department of Health (2013) Health Building Note 00-09: Infection Control in the Built Environment. http://www.nationalarchives.gov.uk/doc/open.
- Department of Health (2014) National Clinical Effectiveness Committee. Second Annual Report www.health.gov.ie/patient-safety ncec@health.gov.ie.
- Department of Health, Nursing and Midwifery Board of Ireland and Office of Nursing and Midwifery Services Directorate (2016) Position Paper: One; Values for Nurses and Midwives in Ireland. Dublin.
- Department of Health (2016) Nursing Medical Interface – Task Transfer (Circular Ref: 3/2016).
- DH (2010) Clean Safe Care. High Impact Intervention. Central Venous Catheter Care Bundle and Peripheral IV Cannula Care Bundle. London: Department of Health.
- DH (2011) High Impact Intervention – Central Venous Catheter Care Bundle. London: Department of Health. Available at: http://webarchive.nationalarchives.gov.uk/20120118164404/hcai.dh.gov.uk/files/2011/03/2011-03-14-HII-Central-Venous-Catheter-Care-Bundle-FINAL.pdf.
- Dougherty L. (2008) Peripheral cannulation. *Nursing Standards* 22(52), 49–56.
- Dougherty L. (2011) Patient's perspective. In: Phillips S, Collins M, Dougherty L, eds, *Venepuncture and Cannulation*. Wiley-Blackwell, Oxford: 281–296.
- Dougherty L. & Lister S. (2008) *The Royal Marsden Manual of Clinical Nursing Procedures*, 7th edn. Chicester, Wiley - Blackwell.
- Dougherty L. & Lister S. (2015) *Royal Marsden Manual of Clinical Nursing Procedures*. 9th edn. Retrieved from http://www.rmmonline.co.uk/manual/c14-fea-0054 on 31 March 2016.
- Dougherty, L. (2008) Obtaining peripheral vascular access. In: Dougherty, L. &Lamb, J. (eds) *Intravenous Therapy in Nursing Practice*, 2nd edn. Oxford: Blackwell Publishing, pp.225–270.

- Dougherty L. & Lamb J. eds (2008) *Intravenous Therapy in Nursing Practice*. 2nd edn. Oxford: Blackwell Publishing.

- European Union (Prevention of Sharps Injuries in the Healthcare Sector) Regulations 2014 (S.I. No. 135 of 2014) transposed into Irish Law Council Directive 2010/32/EU http://www.hsa.ie/eng/Publications_and_Forms/Publications/Healthcare_Sector/Sharps_Regulations_Guidelines_2014.pdf.

- Fields J. M., Piela N. E., Au A. K., Ku B. S. (2014) Risk factors associated with difficult venous access in adult ED patients. *American Journal of Emergency Medicine* 32, 1179–1182.

- Garza, D. & Becan–McBride, K. (2013) *Phlebotomy Simplified*, 2nd edn. Upper Saddle River, NJ: Pearson Education.

- Gay, S. (2010) An inside view of venous thromboembolism. *The Nurse Practitioner* 35(9), 32-39.

- Gibbins, S. Stevens, BJ. & Yamada, J. (2014) Validation of the Premature Infant Pain Profile-Revised (PIPP-R). *Early Human Development*. 2014 Apr;90(4):189-93.

- Government of Ireland (2015) Assisted Decision-Making (Capacity) Act. Stationery Office, Dublin.

- Harrison D., Beggs S., Stevens B. (2012) Sucrose for Procedural Pain Management in Infants. *Paediatrics* 13(5) 918-925.

- Health Building Note 00-09: Infection Control in the Built Environment, Department of Health 2013.

- Health Protection Surveillance Centre (2014) *Prevention of Intravascular Catheter-related Infection in Ireland. Update of 2009 National Guidelines*. SARI Prevention of Intravascular Catheter-related Infection Sub-Committee, Health Service Executive, Dublin.

- Health Protection Surveillance Centre (2015) *Guidelines for hand Hygiene in Irish Healthcare Settings* :Update of 2005 Guidelines.

- Health Services Executive (2014) *Report of the Quality and Safety Clinical Governance Development Initiative - Sharing our learning.* Health Services Executive, Dublin.

- Health Services Executive (2014) *National Consent Policy*. Quality and Safety Division, Health Services Executive, Dublin. Retrieved from http://www.hse.ie/eng/about/Who/qualityandpatientsafety/National_Consent_Policy/consenttrainerresource/trainerfiles/NationalConsentPolicyM2014.pdf on 31 March 2016.

- Health Service Executive, 2015. *Health Service Executive corporate plan 2015-2017*. Dublin: Health Service Executive.

- Health Services Executive (2016) Policy for the Prevention of Sharps Injuries, Health Services Executive, Dublin.

- Health Protection Surveillance Centre (2012) Guidelines for the Emergency Management of Injuries. Health Services Executive, Dublin. Retrieved from http://www.hpsc.ie/A-Z/EMIToolkit/EMIToolkit.pdf on 31st March 2016.

- HSE Quality Improvement Division and the HCAI/AMR Committees. Core Infection Prevention and Control Knowledge and Skills: A Framework Document. May 2015.

- Infusion Nurses Society (2011) Infusion nursing standards of practice. Journal of Infusion Nursing Supplement 34(15), S1–S110.
- Jackson A. Infection control – a battle in vein: infusion phlebitis. *Nursing Times*. 1998; 94(4): 68–71.
- Lamb J. & Dougherty L. (2008) Local and systemic complications of intravenous therapy. In: Dougherty, L. & Lamb, J. (eds) *Intravenous Therapy in Nursing Practice,*2nd edn. Oxford: Blackwell Publishing.
- Loveday H.P., Wilson J.A., Pratt R.J., Golsorki M., Tingle A., Bak A. Browne J., Prieto J., Wilcox M. (2014) epic3: National Evidence Based Guidelines for Preventing Healthcare-Associated Infections in NHS Hospitals in England. *Journal of Hospital Infection* 86 Supplement (1) 1-70.
- McCall R.E. & Tankersley C.M. (2012) *Phlebotomy Essentials*, 5th edn. Philadelphia: Lippincott Williams & Wilkins.
- McCall R.E. & Tankersley C.M. (2015) Phlebotomy Essentials: Sixth Edition. Wolters Kluwer.
- McGowan D. (2014) Peripheral intravenous cannulation: managing distress and anxiety. *British Journal of Nursing (IV Therapy Supplement)* 23(19), S4-S9.
- Mikkelsen G. & Frederiksen K. (2011) Family-centred care of children in hospital – a concept analysis. *Journal of Advanced Nursing* 67(5), 1152–1162.
- Moini J. (2013) *Phlebotomy: Principles and Practice*. Jones & Bartlett Learning, Burlington NJ.
- Morris W. (2011) Complications. In: *Venepuncture and Cannulation.* (Phillips S., Collins M. & Dougherty L., eds), John Wiley & Sons, Oxford, pp.175–222.
- NICE (2012) Infection: prevention and control of healthcare-associated infections in primary and community care. National Clinical Guideline Centre Available: http://guidance.nice.org.uk/CG139/Guidance/pdf/English A.
- Nursing and Midwifery Board of Ireland (2014) *The Code of Professional Conduct and Ethics for Registered Nurses and Registered Midwives.* Nursing and Midwifery Board of Ireland, Dublin.
- Nursing and Midwifery Board of Ireland (2015) *Scope of Nursing and Midwifery Practice Framework*. Nursing and Midwifery Board of Ireland, Dublin.
- Nursing and Midwifery Board of Ireland (2015) RECORDING CLINICAL PRACTICE: Professional guidance http://www.nmbi.ie/ECommerceSite/media/NMBI/Publications/recording-clinical-practice-professional-guidance.
- Nursing and Midwifery Board of Ireland (2016) *Nurse Registration Programmes Standards and Requirements.* Nursing and Midwifery Board of Ireland, Dublin.
- O'Grady N. P., Alexander M., Burns L. A., Dellinger E. P., Garland J. & Heard S. O. (2011). Guidelines for the prevention of intravascular catheter-related infections. *American Journal of Infection Control* 39(4 Suppl 1), S1-S34.
- Perucca R. (2010) Peripheral venous access devices. In: *Infusion Nursing: An Evidence - Based Approach*, 3rd edn. (Alexander M., Corrigan A., Gorski L., Hankins J. & Perucca R. eds) Saunders Elsevier, St Louis MO, pp.456–479.
- Polovich M., Whitford J.M. & Olsen M. (eds.) (2014) *Chemotherapy and Biotherapy Guidelines and Recommendations for Practice,* 4th edn. Oncology Nursing Society, Pittsburgh PA.

- Rowley S. (2001) Aseptic non-touch technique. Nursing Times; *Infection Control Supplement*: 97 (7).
- Rowley S., Clare S. (2009) Improving Standards of aseptic practice through an ANTT® trust-wide implementation process: a matter or prioritisation and care. *British Journal of Infection Prevention*; 10 (1): S18-S23.
- Rowley S., Clare S (2011) ANTT®: a standard approach to aseptic technique. *Nursing Times*; 107: 36 12-14.
- Rowley S., Clare S., Macqueen, S., Molyneux, R. (2010) ANTT® v2: An updated practice framework for aseptic technique. *British Journal of Hospital Infection*; 67 (1): 9-21.
- Royal College of Nursing (2010) *Standards for Infusion Therapy*, 3rd edn. Royal College of Nursing, London.
- Royal Marsden (2015) *Royal Marsden Manual of Clinical Nursing Procedures*. 9th edn. Available online at http://www.rmmonline.co.uk/manual/c14-fea-0054.
- Royal College of Physicians of Ireland Clinical Advisory Group on Health Care Associated Infections in association with HSE Quality Improvement Division. Guidelines for hand hygiene in Irish healthcare settings: Update of 2005 guidelines HPSC Hand Hygiene Guidelines. January 2015.
- Scales, K. (2005) Vascular access: a guide to peripheral venous cannulation. *Nursing Standard* 19(49), 48-52.
- Shrestha M. & Adhikari R.K. (2012) Comparison of Pain Response to Venepuncture Versus Heel Lance Blood Sampling in Term Neonates. *Journal of Nepal Paediatric Society* 32(2), 99-104.
- Strategy for Control of Antimicrobial Resistance in Ireland SARI (2014) Prevention of Intravascular Catheter-related Infection in Ireland. HSE.
- Valdovinos N.C., Reddin C., Bernard C., Shafer B. & Tanabe P. (2009) The use of topical anaesthesia during intravenous catheter insertion in adults: a comparison of pain scores using LMX-4 versus placebo. *Journal of Emergency Nursing* 35(4), 299-304.
- Washington G.T. & Barrett R. (2012) Peripheral phlebitis: a point–prevalence study. *Journal of Infusion Nursing* 35(4), 252–258.
- Weinstein S. & Plumer A.L. (2007) *Plumer's Principles & Practice of Intravenous Therapy*, 8th edn. Philadelphia: Lippincott Williams & Wilkins.
- Weller B.F. (2009) *Bailliere's Nurses Dictionary*, 23rd edn. Elsevier, Edinburgh.
- World Health Organisation (2010) *WHO guidelines on drawing blood: best practices in phlebotomy*. World Health Organisation Publications, Switzerland. Retrieved from http://www.euro.who.int/data/assets/pdf_file/0005/268790/WHO-guidelines-on-drawing-blood-best-practices-in-phlebotomy-Eng.pdf?ua=1 on March 31 2016.
- World Health Organisation (2009) *Guidelines on Hand Hygiene in Health Care*. World Health Organisation, Switzerland. Retrieved from http://apps.who.int/iris/bitstream/10665/44102/1/9789241597906_eng.pdf on March 31 2016.

12 Appendix I Outline of Combined Venepuncture & Intravenous Cannulation Training Programme and Learning Outcomes

VENEPUNCTURE & PERIPHERAL INTRAVENOUS CANNULATION PROGRAMME St. Luke's General Hospital Kilkenny	
Components	***Learning Outcomes***
Introduction • Welcome • Overview of the programme • Signing of Practice Deceleration • Submission of a Pass Result in ***both*** *Venepuncture & Peripheral Intravenous Cannulation Self-Assessment online.* (A copy of the pass results in both self assessments is required in order to proceed to the SLGH Combined Venepuncture & Peripheral IV Cannulation training education programme).	• Identify anatomical structures and explain the appropriate choice of sites applicable to Venepuncture /IV Cannulation • Describe the role of the nurse/midwife in undertaking the skill of Venepuncture/ IV Cannulation • Outline the indications for Venepuncture /IV Cannulation • Communicate with patients to facilitate safe and effective Venepuncture/ IV Cannulation • Demonstrate knowledge of: 1. Preparation for the procedures and how to obtain informed consent 2. The effective techniques for both procedures 3. Blood draw sequence and the correct use of equipment 4. Documentation and correct labelling • Management of complications
Infection Prevention & Control • Hand Hygiene • Personal Protective Equipment • Management and Disposal of Sharps • Blood Borne Viruses • Aseptic Technique and prevention of HCAI	• Identify the appropriate hand hygiene and personal protective equipment required for the procedure • Explain the safe management and disposal of sharps, and the risks associated with the transmission of blood borne viruses during the procedure • Explain the appropriate aseptic technique required throughout the procedure
Venous Site Selection • Structure of the Veins • Anatomy of Veins, Nerves and Arteries • Selection of a Venous Site • Clinical Assessment to Choose a Vein	• Identify the relevant veins, nerves and arteries that relate to Venepuncture/ IV Cannulation • Undertake a clinical assessment to choose the appropriate vein
Preparation for Procedure • Choosing Equipment • Determine the blood collection sets and bottles required for the procedure	• Determine the type of equipment required • Determine the blood collection sets and bottles required for the procedure
Procedure • Indications for Procedure • Communication • Consent • Topical Anaesthetic Agents • Tourniquet Use and Application • Standard Equipment for the Venepuncture / IV Cannulation Procedure • The Venepuncture/Peripheral IV Cannulation procedures	• Outline the indication for Venepuncture / IV Cannulation and obtain informed consent • Describe the importance of communicating effectively with the patient and family • Describe the pharmacological and non-pharmacological methods of pain relief • Explain the requirement for topical anaesthetic agents and be familiar with their indications and applications • Identify when other healthcare professionals should be involved in assisting with the procedure • Discuss the application of the tourniquet • Describe the standard equipment required and how to safely carry out Venepuncture/IV Cannulation procedures

Clinical Skills Demonstration and Practice Session	• Demonstration and opportunity to practice and attain the skill of venepuncture and peripheral intravenous Cannulation using artificial injectable training arms in an educational environment.
Aftercare • Maintenance of a Peripheral IV Cannula • Potential Problems and Complications • Removal of a Peripheral IV Cannula • Documentation	• Outline the monitoring and maintenance of the peripheral intravenous cannula taking account of the peripheral vascular catheter Care Bundle • Identify potential problems and complications associated with Venepuncture/IV Cannulation and outline the appropriate actions to prevent and treat these complications • Explain the indications and procedure for removal of a peripheral intravenous cannula • Critically discuss the importance of documentation in relation to the Venepuncture/IV Cannulation procedure

13 Appendix II Record of Supervised Practice Assessments

Peripheral Intravenous Cannulation
Record of Supervised Practice Assessments
St. Luke's General Hospital (SLGH) Kilkenny

The purpose of this document is to provide evidence of supervised practice and demonstrate competence progression under supervision.

Name & (Initials)			
Job Title			
Organisation			
Department			
Clinical Skill	Peripheral Intravenous Cannulation	Date Started:	Date Completed:
Clinical Assessor Name & (Initials)	1.	2.	
Clinical Assessor Name & (Initials)	3.	4.	
Clinical Assessor Name & (Initials)	5.	6.	
Clinical Assessor Name & (Initials)	7.	8.	
Clinical Assessor Name & (Initials)	9.	10.	

The nurse/midwife must be able to discuss the rationale for each of the actions and demonstrate competence in the practical application of these skills as applicable

	Skill Required	SUPERVISED PRACTICE ASSESSMENTS Achieved = √ Not Achieved = 0									
		1	2	3	4	5	6	7	8	9	10
A	Confirms indication for peripheral IV cannulation										
B	Correct procedure for identification of patient										
C	Appropriate patient preparation and communication										
D	Chooses and handles equipment confidently and correctly										
E	Considers personal safety and that of others										
F	Correct identification of suitable vein										
G	Appropriate venous dilation methods										
H	Provision of local anaesthesia as required (as per SLGH Guideline for Undertaking Peripheral IV Cannulation in Adults 2012)										
I	Cannula insertion										
J	Flush to confirm patency										
K	Secure and anchor cannula safely and effectively										
L	Appropriate troubleshooting techniques										
M	Appropriate aseptic technique followed throughout										
N	Management of equipment										
O	Disposal of sharps safely										
P	Completes accurate documentation of procedure (as per SLGH Guideline for Undertaking Peripheral IV Cannulation in Adults 2012)										
	Initial of Clinical Assessor:										
	Initial of Nurse/Midwife										
	Date:										

The number of these supervisions will vary between individuals so please copy this form if you require more supervised assessment

A modified version of the Record of Supervised Practice Assessments - A Guiding Framework for Education, Training and Competence Validation in Venepuncture and Peripheral Intravenous Cannulation for Nurses and Midwives. Office of the Nursing and Midwifery Services Director (2010) G:\Molloy\Hel\IV Cannulation 2012\Peripheral intravenous Cannulation - Record of Supervised Practice Assessments 2012.doc Created on 11/07/2012 14:14:00

14 Appendix III Final Competency Assessment

Peripheral Intravenous Cannulation
Final Competence Assessment
St. Luke's General Hospital (SLGH) Kilkenny

Final Assessment

Essential skills, demonstrating competence for independent practice.

Name	
Job Title	
Organisation	
Department	
Clinical Skill	Peripheral Intravenous Cannulation
Clinical Assessor	

	The nurse/midwife demonstrated	Pass	Refer
1	Appropriate communication with the patient throughout		
2	Safe technique throughout the whole procedure		
3	Familiarity with equipment		
4	Aseptic technique throughout		
5	Correct positioning of patient and preparation of environment		
6	Chooses appropriate vein site and equipment for peripheral intravenous cannulation		
7	Provides local anaesthesia (as per SLGH Guideline for Undertaking Peripheral Intravenous Cannulation in Adults 2012)		
8	Completes peripheral intravenous cannulation procedure correctly and safely (as per SLGH Guideline for Undertaking Peripheral Intravenous Cannulation in Adults 2012)		
9	Disposes of sharps and equipment correctly and safely		
10	Completes accurate documentation of procedure (as per SLGH Guideline for Undertaking Peripheral Intravenous Cannulation in Adults 2012)		
	Outcome (please tick √ as applicable)	Pass ☐	Refer ☐

OUTCOME AGREED		
Date:	Nurse / Midwife:	Clinical Assessor:
	Sign:	Sign:
	Print:	Print:
Note of action if referred for further assessment:		
ACTION PLAN AGREED		
Date:	Nurse / Midwife:	Clinical Assessor:
	Sign:	Sign:
	Print:	Print:

A modified version of the Final Competence Assessment - A Guiding Framework for Education, Training and Competence Validation in Venepuncture and Peripheral Intravenous Cannulation for Nurses and Midwives. Office of the Nursing and Midwifery Services Director (2010) G:\MolloyHel\IV Cannulation 2012\Peripheral Intravenous Cannulation - Final Competency Assessment Form 2012.doc Created on 11/07/2012 14:44:00

15 Appendix IV Skills Completion Checklist

Peripheral Intravenous Cannulation Skill Completion Checklist

St. Luke's General Hospital (SLGH) Kilkenny

Name	
Job Title	
Organisation	
Department/Ward/Unit	
Clinical Skill	Peripheral Intravenous Cannulation
Clinical Assessor	
Date Programme Commenced *(must be completed within 3 months)*	
Date Programme Completed	

The nurse or midwife will be able to discuss the rationale for each of the following actions and demonstrate competence in the practical application of peripheral intravenous cannulation skills, in line with the Scope of Nursing and Midwifery Practice Framework (An Bord Altranais 2000).

	Actions and skills required	Achieved	Date
1	Preliminary discussion with line manager and be approved to undertake the peripheral intravenous cannulation skill pathway		
2	Read 'SLGH Guideline for Undertaking Peripheral Intravenous Cannulation in Adults 2012'		
3	Read the "Code of Professional Conduct" and the "Scope of Nursing and Midwifery Practice Framework" (An Bord Altranais 2000)		
4	Completed the HSE eLearning Module of the blended learning education programme for Peripheral Intravenous Cannulation		
5	Attended the approved *SLGH Combined Venepuncture & Peripheral IV Cannulation Education& Training programme.*		
6	Successfully completed the SLGH Clinical Knowledge Theoretical Assessment		
7	Attended a skills demonstration and practice session and has become familiar with and practiced with equipment used in *St. Luke's General Hospital Kilkenny*		
8	Has been deemed suitable to proceed to supervised practice by course facilitator		
9	Completed and recorded 5-10 supervised practice assessments		
10	Successfully completed the Final Competence Assessment and has been deemed competent by the Clinical Assessor for independent practice		

Competence agreed for Peripheral Intravenous Cannulation
I agree to maintain my clinical competence in peripheral intravenous cannulation in line with the Scope of Nursing and Midwifery Practice Framework (An Bord Altranais 2000) (recommend performing 10 IV cannulation procedures per month)

Date:	Nurse / Midwife:	Clinical Assessor:
	Sign:	Sign:
	Print:	Print:

Clinical Nurse/Midwife Manager:
I am satisfied that the above named person has attended the necessary education & training and has completed the related competence programme.

Sign _____ Print _____ Date_____

*Send Copy of completed checklist to one of the Course Facilitators to receive your Certificate of Competence Achievement and keep a copy for your own records.

A modified version of the Final Competence Assessment - A Guiding Framework for Education, Training and Competence Validation in Venepuncture and Peripheral Intravenous Cannulation for Nurses and Midwives. Office of the Nursing and Midwifery Services Director (2010) G:\MolloyHel\IV Cannulation 2012\Peripheral Intravenous Cannulation - Skill Completion Checklist 2012.doc Created on 13/07/2012 12:35:00

16 Appendix V Certificate of Competence

St. Luke's General Hospital
Kilkenny

Adult Peripheral Intravenous Venepuncture & Cannulation

Certificate of Competence

This is to certify that

_____ Personnel no._____

is considered competent to perform Adult Peripheral Intravenous Venepuncture & Cannulation and has successfully completed the following –

- An Education Programme on Adult Peripheral Intravenous Venepuncture & Cannulation

- Clinical Practical Assessment for Adult Peripheral Intravenous Venepuncture & Cannulation

Certified By: _____ Date: _____

I certify that I consider myself competent to carry out the above practices safely and effectively and agree to engage in this advanced practice in accordance with hospital policy.

_____ Date: _____
Nurse/Midwife

_____ _____
Course Facilitator Director of Nursing & Midwifery Services

17 Appendix VI Skills Pathway Algorithm for Peripheral Intravenous Cannulation for Nurses and Midwives

The following skill pathway outlines the eight steps involved in order for the nurse/midwife to obtain competence in undertaking the clinical skills of peripheral intravenous cannulation.

Step One - Approval to Undertake Skill

If undertaking the SLGH Combined Venepuncture & Peripheral Intravenous Cannulation Programme, nurses and midwives must obtain approval from their Clinical Nurse/Midwife Manager/Nurse Practice Development Facilitator /Director of Nursing/Midwifery to undertake the programme. Arrange by booking a place with one of the Programme Facilitators at St. Luke's General Hospital Kilkenny.

Step Two - Guideline Documents

Read and familiarise yourself with the following guideline documents
SLGH Guideline for Insertion, Care and Maintenance and Removal of Peripheral Intravenous Cannula in Adults
SLGH Guideline for Undertaking Venepuncture in Adults

Step Three - Undertake the HSE online eLearning Module for Peripheral Intravenous Cannulation

Undertake the HSE eLearning Module online via www.hseland.ie which provides an introduction to the theory and practice of venepuncture and peripheral intravenous cannulation with practical demonstrations on video. The module contains a self assessment section which must be undertaken on completion of the theoretical instruction. The Nurse/Midwife must pass the online Self Assessment Test in both Venepuncture and Peripheral Intravenous Cannulation (print score sheets/certificates of completion) and provide this documented evidence that the Self Assessment Tests were passed prior to attending the SLGH Combined Venepuncture & Peripheral Intravenous Cannulation Training Programme.

Step Four - Attend the Combined Venepuncture & Peripheral IV Cannulation Training Programme

Upon completion of the theoretical component of the programme, you will undertake the clinical knowledge theoretical assessment. This is a multiple choice examination. Following this you will proceed to a clinical simulated Demonstrations and supervised Practice Sessions for both venepuncture and peripheral intravenous cannulation with the equipment used in St. Luke's General Hospital. When deemed suitable by the programme facilitator you may proceed to supervised clinical practice.

Step Five - Clinical Practice Assessor

A list of clinical practice assessor in the clinically areas will be issued to you on the Education Programme. In conjunction with your clinical nurse/midwife manager the nurse/midwife must identify a clinical practice assessor who will support them to undertake the required number of supervised clinical practice assessments in the clinical area.

Step Six - Clinical Supervised Practice

In conjunction with your clinical practice assessor, the nurse/midwife must undertake a minimum of 5 successful Clinical Supervised Practice Competency Assessment for both venepuncture and peripheral intravenous cannulation prior to achieving competency. The Record of Supervised Practice and Competency Assessment (Refer to Appendix II) must be signed on each assessment by the clinical practice assessor. This must be completed within a twelve week time frame from commencement of attending the Combined Venepuncture and Peripheral Intravenous Education Programme.

In the event of the nurse/midwife being unsuccessful in the final competence assessment, a further period of twelve weeks will be granted in order to achieve competence assessment. The clinical assessor will develop and agree a performance improvement action plan with the nurse/midwife. Additional supervised practice assessments should be arranged and a date rescheduled for the final competence assessment.

On successful completion of the Clinical Supervised Practice Competency Assessments, the Clinical Nurse/Midwifery Manager in the clinical are must also sign the Record of Supervised Practice and Competency Assessment Form.

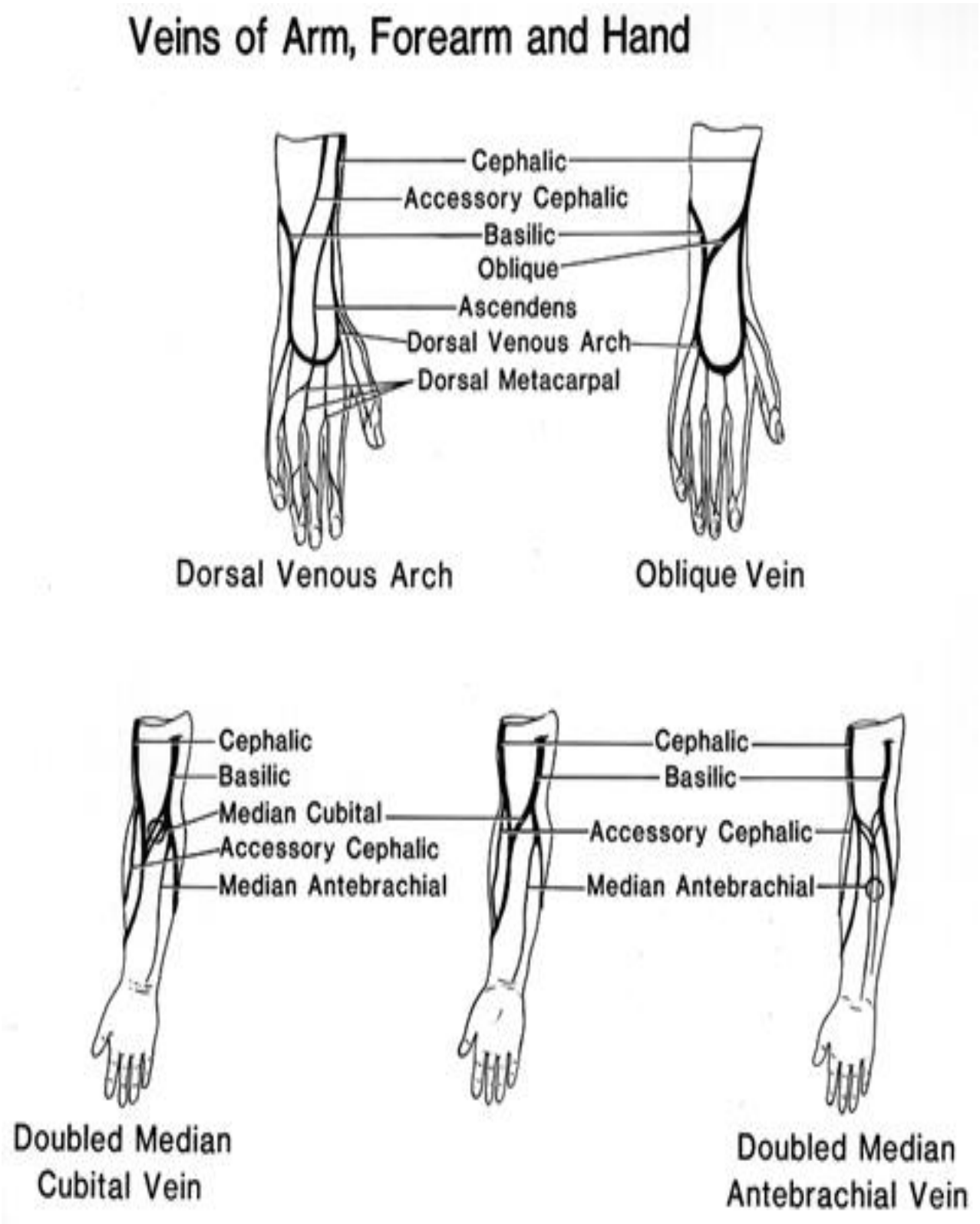
Step Eight - Record of Competence Achievement

The Nurse/Midwife must submit the completed Record of Supervised Practice and Competency Assessment Form (Refer to Appendix II) to the programme facilitators/Nurse Practice Development Facilitator. A Certificate of Competence Achievement in Venepuncture and Peripheral Intravenous Cannulation will be issued by the programme facilitators/Practice Development Facilitator on receipt of the completed Record of Supervised Practice and Competency Assessment Form.

Step Nine - Maintenance of Competence

Upon completion of the skill pathway, each nurse or midwife should have the knowledge, skills and competence to independently practice the skill of peripheral intravenous cannulation.
In order to maintain clinical competence, it is recommended that the nurse/midwife should undertake the practice of peripheral intravenous cannulation on a regular basis. It is also important to keep up to date with changes in best practice, and to keep abreast of equipment utilised for the procedure. Maintain ongoing competence through self-assessment and Scope of Nursing & Midwifery Practice Framework (NMBI 2015).

18 Appendix VII Anatomy of Upper Extremity Veins



Anatomy of Upper Extremity Veins

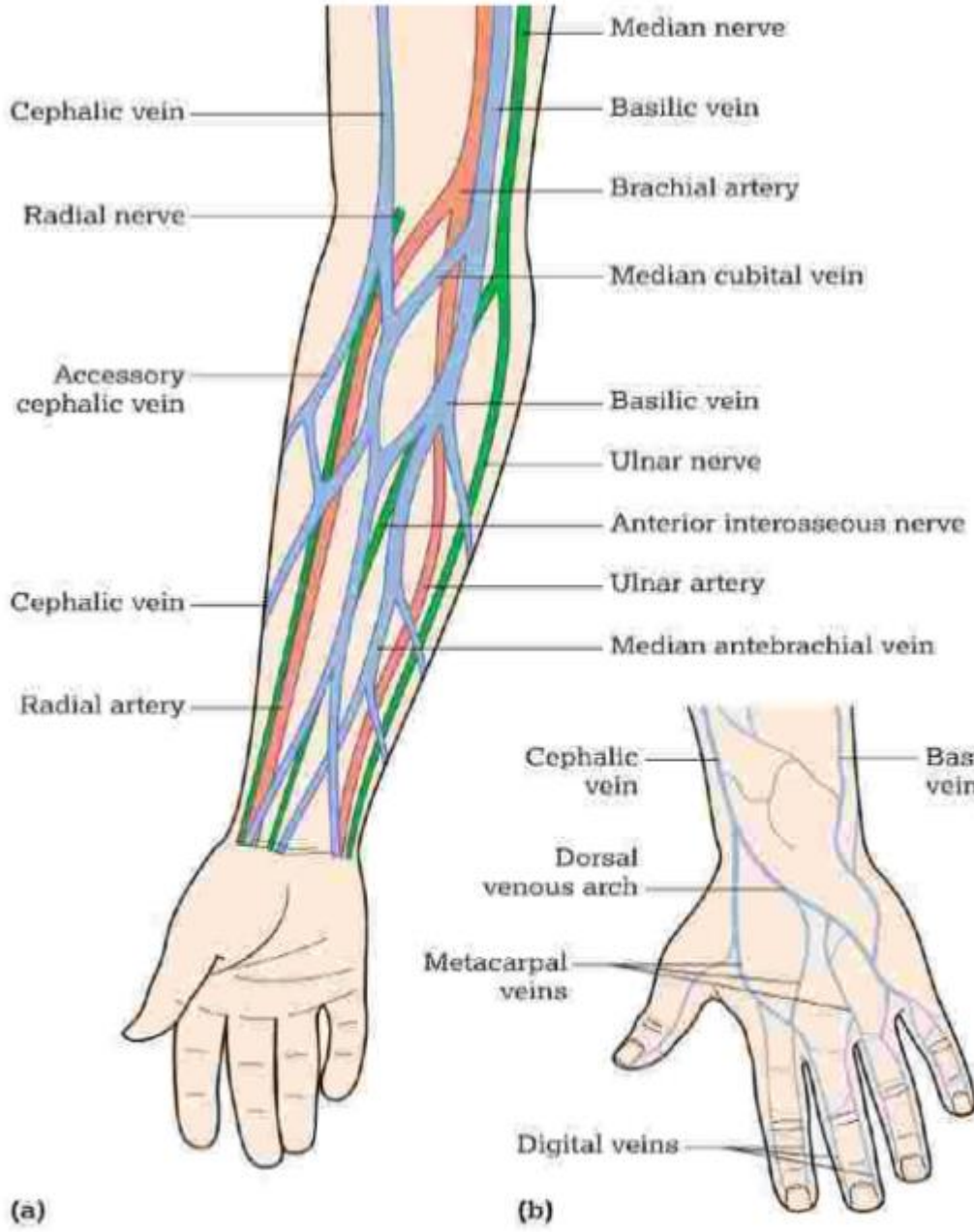


Figure i (a) Superficial veins of the forearm. (b) Superficial veins of dorsal aspect of the hand.

19 Appendix VIII Peripheral Intravenous Cannula Types

Equipment required should be based on an assessment of the patient and is as follows:

Peripheral Intravenous Cannula Types – Adults				
Colour	**Purpose**	**Guage Size**	**Flow Rate** (Litre per 24hr)	**Volumes**
Blue	Patients with Small Veins	22G	1-2 litres	Small (maintenance fluids in elderly)
Pink	Intravenous fluids, Blood Transfusion	20G	2-3 litres	Medium
Green	Blood Transfusion and Large Volume Replacement Fluids	18G	2-5 litres	Large
Grey	Theatre Use, Emergency Use, Rapid Fluid Replacement	16G	7-11 litres	Extra Large

Source: Taken from: Health Service Executive/ Office of the Nursing Services Director (2010) A guiding Framework for Education, Training and Competence Validation in Venepuncture and Peripheral Intravenous Cannulation for Nurses and Midwives. HSE /Office of the Nursing Services Director. Dublin.

20 Appendix IX Management of Potential Complications

Potential Complications of Peripheral Intravenous Cannulation

Pain	Pain is an unpleasant sensory and emotional experience associated or described with actual or potential tissue damage (Shrestha M. & Adhikari R.K. 2012)
Cause	• tentative stop–start insertion (often associated with hesitant or new practitioners) • hitting an artery, nerve or valve • poor technique – inadequate anchoring causes skin to gather as the needle is inserted • alcohol is not allowed to dry adequately before insertion, resulting in stinging pain.
Signs	• using a frequently punctured, recently used or bruised vein • anxious patient, may have low pain threshold • use of large–gauge device • use of veins in sensitive areas (Dougherty 2008).
Prevention	• Body language, verbal expression, facial expression • Pain can be prevented by using methods to relax and relieve anxiety, or the use of local anaesthetic creams.
Treatment	• If the patient complains of pain, depending on the cause (e.g. nerve or artery), it may be necessary to remove the device immediately • Reassure the patient.

Venous Spasm	Venous spasm is a sudden involuntary contraction of the vein, resulting in temporary cessation of blood flow in the vein
Cause	• Venous spasm is caused by fear and anxiety and is usually stimulated by cold infusates and mechanical or chemical irritation.
Signs	• Expressions of pain (verbal or non-verbal) such as facial expressions or crying • Cramping • Numbness above the PIVC site.
Prevention	• Explain the procedure to reduce fear and anxiety • Give infusions at room temperature (commence infusions slowly).
Treatment	• Gently massage or warm the limb and retry • Slow down the process of PIVC (there is no need to remove the needle). • Wait for the vein to relax and wait for blood to return into the flash chamber before proceeding • During intravenous therapy, reduce the rate of infusion flow, especially in solutions known to be irritant.

Needle stick injury	A needle stick injury (percutaneous inoculation injury) is an inadvertent puncture of the skin with a potentially contaminated needle, see Appendix 3 (a). Management of BBV risk following exposure to needlestick/sharps in occupational or community setting. (Health Protection Surveillance Centre 2016) www.emitoolkit.ie
Cause	• Inadvertent puncture of the skin during the venepuncture procedure.
Signs	• Pain • Bleeding • A visible puncture of the skin of the nurse or midwife.
Prevention	• The application of Infection Prevention & Control and Health and Safety will support safe practice.
Treatment	• Encourage the wound to bleed freely • Wash the affected area with liquid soap under running water. Do not scrub (EMI Guidelines 2012) • Apply a waterproof dressing over the affected area • Report the incident to your line manager • Record the incident accordingly by completing the relevant incident form • Submit the incident form to your risk manager or line manger • For follow-up and advice, contact your Occupational Health Dept. and/or the Emergency Dept. as per local organisational guidelines.

Nerve Injury	If a nerve is accidentally hit on insertion of the needle into the vein, this will result in pain and can lead to injury and possibly permanent damage (McCall & Tankersley 2012
Cause	• Poor vein selection • Inserting the needle too deeply or quickly • blind probing.
Signs	• Described as severe shooting pain • Painful burning sensation (Moini 2013) • A sharp electric tingling sensation that radiates down the nerve (McCall and Tankersley 2012).
Prevention	• Appropriate clinical assessment • Appropriate site selection • Skilled technique.
Treatment	• In the event of touching a nerve, release the tourniquet and remove the needle immediately (Garza & Becan McBride 2013) • Reassure the patient and explain that the pain may last for a few hours and the area may feel numb • Explain that the pain can sometimes last for a few days and that, if it continues or gets worse, medical advice should be sought • Give the patient an information sheet with advice about when and who to contact and document the incident (Dougherty 2008, Garza & Becan McBride 2013).

Haematoma	Haematoma is the leakage of blood into the tissues indicated by rapid swelling which occurs during the insertion procedure or after removal (Perucca 2010, McCall & Tankersley 2015)
Cause	• penetration of the posterior vein wall • incorrect choice of needle to vein size • fragile veins • patients receiving anticoagulant therapy • excessive or blind probing to locate the vein • failure to remove the tourniquet promptly or failure to release it before removing the needle • inadequate pressure on venepuncture site following removal of the cannula (Dougherty 2008, McCall & Tankersley 2012, Moini 2013).
Signs	• Pain, loss of mobility or reluctance to move the affected limb • Swelling, discolouration or coolness of the area adjacent to the cannula.
Prevention	• Good vein and device selection and using a careful technique • The practitioner should always be aware of patients with fragile veins or those on anticoagulant therapy and inexperienced individuals should not attempt cannulation in these individuals (Perucca 2010) • A tourniquet should not be applied to a limb where recent venepuncture has occurred and the tourniquet should not be left in place for any longer than necessary • On removal of the cannula, adequate pressure should be applied to the site. Alcohol pads inhibit clotting and should not be used (Perucca 2010).
Treatment	• In the event of a haematoma occurring, tourniquet is released, the cannula should be removed immediately and pressure applied to the site for a few minutes (McCall & Tankersley 2012, Garza & Becan McBride 2013) • Elevate the extremity if appropriate and reassure the patient and explain the reason for the bruise • Apply a pressure dressing if required and an ice pack if bruising is extensive (Moini 2013).

Arterial Puncture	The inadvertent puncture of the artery is another complication associated with cannulation
Cause	• Inappropriate selection of the cannulation site • Poor technique.
Signs	• Presence of bright red blood • Expression of pain.
Prevention	• Appropriate clinical assessment – palpate artery • Appropriate site selection • Skilled technique.
Treatment	• Release the tourniquet, removing the cannula immediately and apply pressure until haemostasis has been achieved • Explain and reassure the adult regarding what has happened • Request that a member of staff is informed if bleeding recurs from the puncture site, if pain continues or if there is increasing swelling or bruising • Arrange a medical review • Monitor, treat as prescribed and document in healthcare records and the nursing care plan • Report the occurrence of this complication, as per local organisational policy.

Phlebitis	Phlebitis is an acute inflammation of the intima of a vein (Dougherty 2008)
Cause	Three types of phlebitis can occur in relation to PIVC • Mechanical phlebitis is related to irritation and damage to a vein by large–gauge cannulas, sited where there is movement, for example in the antecubital fossa, inadequate securing of PIVC or increased PIVC dwell time. • Chemical phlebitis is related to chemical irritation from drugs such as antibiotics and chemotherapy • Bacterial phlebitis is when the site becomes infected due to poor hand–washing or aseptic technique and has a potential to predispose a patient to septicaemia or catheter related blood stream infections (CRBSIs) (Lamb and Dougherty 2008 & Morris 2011).
Signs	• Characterized by pain and tenderness along the cannulated vein, erythema, warmth and streak formation with/without a palpable cord (Washington & Barrett 2012) • Loss of mobility or reluctance to move the affected limb • Redness, inflammation, or purulent ooze at the cannula site.
Prevention	• Regular monitoring using a VIP score • Observe for thrombophlebitis. Veins of the lower extremities should not be routinely used in adults due to the risk of embolism and thrombophlebitis (RCN 2010, INS 2011).
Treatment	• Remove PIVC if the patient develops signs of phlebitis (warmth, tenderness, erythema or palpable vascular cord), infection or a malfunctioning catheter (O' Grady et al. 2011). Refer to PIVC removal guidelines in 4.3.13.

Thrombophlebitis	Thrombophlebitis is the inflammation of a vein with a thrombus formation
Cause	• Traumatic cannulation by an unskilled practitioner or multiple attempts • Use of too large a cannula for the size of the vein • Infusion of high pH solution or poor circulation with venous stasis.
Signs	• Local redness, hard and torturous feel of the vein, heat, painful to touch or move • Expressions of pain (verbal or non-verbal) such as facial expressions or crying.
Prevention	• Early detection is crucial with at least one hourly monitoring of the cannulation site • Appropriate site selection • Appropriate selection of equipment for size of vein • Skilled technique.
Treatment	• Discontinue infusion, remove the cannula, and elevate the extremity • Report the incident of this complication as per local organisational • Treat as prescribed and document the care.

Infiltration	Infiltration is the "inadvertent administration of a non-vesicant (non-irritant) solution or medication into surrounding tissue instead of the intended vascular pathway" (RCN 2010, p.60; INS 2011)
Cause	• Cannula too large for the diameter of the vein • Puncture of distal wall of vein during cannulation • Poorly secured cannula • Over manipulation of cannula • Delivery of fluid at a high rate or pressure (Dougherty & Lister 2008).
Signs	• Swelling and oedema, pain, loss of mobility or reluctance to move the affected limb • Skin cool to touch • Skin blanching adjacent to cannula.
Prevention	• Monitoring of cannula as per local care bundle/care plan. Ensure the cannula is secured correctly.
Treatment	• Immediately remove the cannula and Refer to PIVC removal guidelines in 4.3.13 • Apply sterile dressing as per ANTT® • Administer analgesia as prescribed.

Embolism	An embolism is an air bubble, fat particle or blood clot which travels, causing a blockage in the vein
Cause	• Dislodged blood clot (thrombo embolism), fragment of catheter (cannula embolism), air (air embolism).
Signs	• Thromboembolism embolism – rapid onset of dyspnoea, discomfort or pain, tachycardia, leading to haemodynamic collapse (Gay 2010) • Air embolism – hypotension, dyspnoea, tachypnoea.
Prevention	• Embolism can be prevented by stopping air from entering the system • ensuring that all connections are secure • IV tubings/lines primed with infusates and prevent the infusion IV tubings from being allowed to run dry.
Treatment	• Treat as a medical emergency and implement the escalation protocol as per local.

Extravasation	"Extravasation is the inadvertent administration of a vesicant (irritant) solution or medication into surrounding tissue instead of the intended vascular pathway" (RCN 2010, p.60; INS 2011)
Cause	• Leakage of vesicant solutions into the tissues. Drugs capable of causing tissue damage and necrosis include but are not limited to cytotoxic drugs, potassium chloride, hypertonic solutions of sodium bicarbonate and drugs with a vaso constrictive action (Lamb & Dougherty 2008).
Signs	• Pain • Reluctance to move affected limb • blistering (typically occurs 1–2 weeks post extravasation) • peeling and sloughing of the skin (about 2 weeks post extravasation) • tissue necrosis (2–3 weeks post extravasation) with resulting pain • damage to tendons, nerves and joints • functional and sensory impairment of affected area such as limb disfigurement.
Prevention	• Early detection and immediate action is crucial, with at least hourly monitoring of the cannulation site • Ensure the cannula is secured correctly.
Treatment	• Stop the infusion and inform the patient and member of the medical team • Immediately remove the cannula if indicated and apply a sterile dressing • Administer analgesia as prescribed • Complete adverse incident form as per local protocol.

Source: Taken from HSE/ONMSD (2017) Guiding Framework for Education, Training and Competence Validation in Venepuncture and Peripheral Intravenous Cannulation for Nurses and Midwives.

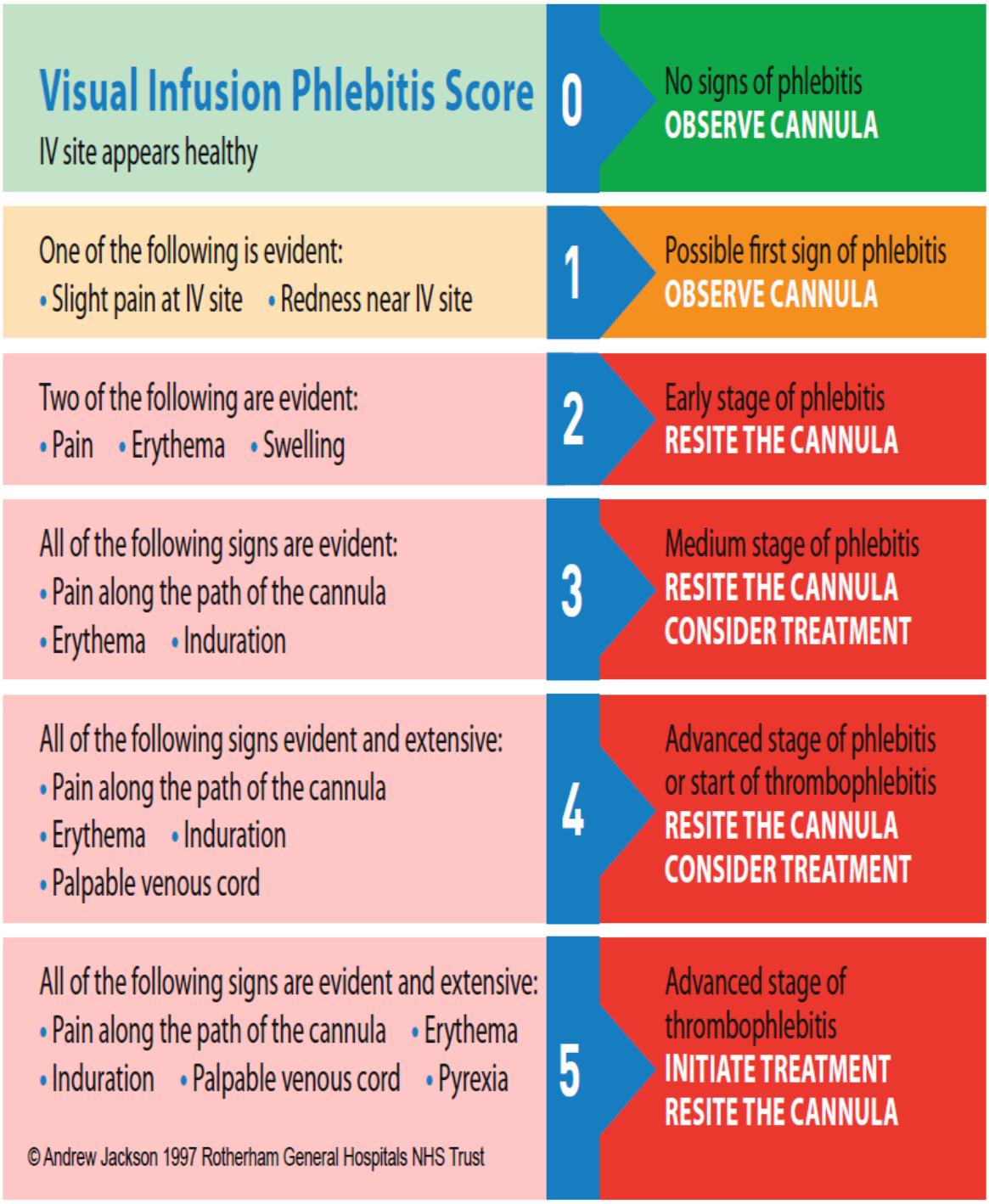
PVC Problem Solving Prevention and Resolution

(Source Taken from Dougherty & Lister 2015)

Problem	Cause	Prevention	Action Suggested
Pain	Use of vein in sensitive area (e.g. wrist).	Avoid using veins in sensitive areas wherever possible. Use local anaesthetic cream.	Complete procedure as quickly as possible.
Anxiety	Previous trauma. Fear of needles.	Minimize the risk of a traumatic venepuncture. Use all methods available to ensure successful venepuncture.	Approach patient in a calm and confident manner. Listen to the patient's fears and explain what the procedure involves. Offer patient opportunity to lie down. Suggest use of local anaesthetic cream (Lavery and Ingram). All of the above and perhaps referral to a psychologist if fear is of phobic proportions.
Limited venous access	Repeated use of same veins. Peripheral shutdown. Dehydration. Hardened veins (due to scarring and thrombosis). Poor technique/choice of vein or device.	Use alternative sites if possible. Ensure the room is not cold. Ensure correct device and technique are used.	Do not attempt the procedure unless experienced. Put patient's arm in warm water. Apply glycerol trinitrate patch. May be necessary to rehydrate patient prior to venepuncture. Do not use these veins as venepuncture will be unsuccessful.
Needle inoculation of or contamination to practitioner	Unsafe practice. Incorrect disposal of sharps.	Maintain safe practice. Activate safety device. Ensure sharps are disposed of immediately and safely.	Follow accident procedure for sharps injury, for example make site bleed and apply a waterproof dressing. Report and document. An injection of hepatitis B immunoglobulin or triple therapy may be required.
Accidental blood spillage	Damaged/faulty equipment. Reverse vacuum.	Check equipment prior to use. Use vacuumed plastic blood collection system. Remove blood tube from plastic tube holder before removing needle.	Report within hospital and/or MHRA. Ensure blood is handled and transported correctly.

Problem	Cause	Prevention	Action Suggested
Missed vein	Inadequate anchoring. Poor vein selection. Wrong positioning. Lack of concentration. Poor lighting. Difficult venous access.	Ensure that only properly trained staff perform venepuncture or that those who are training are supervised. Ensure the environment is well lit.	Repalpate, withdraw the needle slightly and realign it, providing the patient is not feeling any discomfort. Ensure all learners are supervised. If the patient is feeling pain, then the needle should be removed immediately. Ask experienced colleague to perform the procedure.
Spurt of blood on entry	Bevel tip of needle enters the vein before entire bevel is under the skin; usually occurs when the vein is very superficial.		Reassure the patient. Wipe blood away on removal of needle.
Blood stops flowing	Needle inserted too far. Contact with valves. Venous spasm. Vein collapse. Small vein. Poor blood flow.	Correct angle. Palpate to locate. Results from mechanical irritation and cannot be prevented. Use veins with large lumen. Use a smaller device. Avoid use of small veins wherever possible. Use veins with large lumens.	Draw back the needle, but if bruising is evident, then remove the needle immediately and apply pressure. Withdraw needle slightly to move tip away from valve. Gently massage above the vein or apply heat. Release tourniquet, allow veins to refill and retighten tourniquet. May require another venepuncture. Apply heat above vein.

21 Appendix X Visual Phlebitis (VIP) Score



Andrew Jackson (1997) IV Nurse Consultant, The Rotherham NHS Foundation Trust UK

22 Appendix XI PVC Insertion Management & Removal Record /NEWS Observation Chart Adult

PERIPHERAL IV CANNULA INSERTION, MANAGEMENT & REMOVAL RECORD (IV Cannula Care Bundle)

Please affix patient label here.
Labels should contain the following information:
- Name
- Address
- Date of Birth
- Healthcare Record Number

Peripheral IV Cannula Insertion Record

	Date of Insertion	Time of Insertion	Site of Insertion	Size of Cannula	Adherence to Aseptic Technique	Name of Person Inserting Device
1						
2						
3						
4						

Removal Record

	Date of Removal	Adherence to Aseptic Technique	Name of Person Removing Device	Removal Reason
				Not Required ☐ Phlebitis (& Score) ☐ Infiltration ☐ Extravasation ☐ Insitu ≤ 96hrs ☐ Other:
				Not Required ☐ Phlebitis (& Score) ☐ Infiltration ☐ Extravasation ☐ Insitu ≤ 96hrs ☐ Other:
				Not Required ☐ Phlebitis (& Score) ☐ Infiltration ☐ Extravasation ☐ Insitu ≤ 96hrs ☐ Other:
				Not Required ☐ Phlebitis (& Score) ☐ Infiltration ☐ Extravasation ☐ Insitu ≤ 96hrs ☐ Other:

No.	Time	Hand Hygiene	Continuing Clinical Indication	Patent Y/N	Dressing Intact Y/N	Condition of Site	VIPS	Flush Y/N	Initials
DAY 1									
DAY 2									
DAY 3									
DAY 4									

No.	Time	Hand Hygiene	Continuing Clinical Indication	Patent Y/N	Dressing Intact Y/N	Condition of Site	VIPS	Flush Y/N	Initials
DAY 1									
DAY 2									
DAY 3									
DAY 4									

Visual Infusion Phlebitis Score (VIPS)

Condition of Site	Score	Degree of Phlebitis	Condition of Site	Score	Degree of Phlebitis
IV Site appears healthy	0	No signs of phlebitis OBSERVE CANNULA	All of the following signs are present: • Pain along path of cannula • Erythema • Induration	3	Medium stages of Phlebitis RESITE CANNULA CONSIDER TREATMENT
One of the following is evident: • Slight pain near IV Site Or • Slight redness near IV Site	1	First signs of phlebitis OBSERVE CANNULA	All of the following signs are evident and extensive: • Pain along path of cannula • Erythema • Induration • Palpable venous cord	4	Advanced stages of phlebitis or the start of Thrombophlebitis RESITE CANNULA CONSIDER TREATMENT
Two of the following are evident: • Pain at IV Site • Erythema • Swelling	2	Early stages of phlebitis RESITE CANNULA	All of the following signs are evident and extensive: • Pain along path of cannula • Erythema • Induration • Palpable venous cord • Pyrexia	5	Advanced stages of Thrombophlebitis INITIATE TREATMENT RESITE CANNULA

23 Appendix XII PPPG Development Group Membership

Ms Eithne Byrne
Venepuncture & IV Peripheral
Cannulation Facilitator

Ms. Maeve Drennan
Venepuncture & IV Peripheral
Cannulation Facilitator

Ms. Meleesa Enright
Venepuncture & IV Peripheral
Cannulation Facilitator

Ms. Helen Molloy
Nurse Practice Development Facilitator

24 Appendix XIII Peer Review of Policy, Procedure, Protocol or Guideline

Reviewer: The purpose of this statement is to ensure that a Policy, Procedure, Protocol or Guideline (PPPG) proposed for implementation is circulated to a peer review (internal or external). You are asked to sign this form to confirm to the committee developing this Policy or Procedure or Protocol or Guideline that you have reviewed and agree the content and approve the following Policy, Procedure, Protocol or Guideline for use within the organisation:

Guideline for Undertaking Peripheral Intravenous Cannulation in Adults

I acknowledge the following:

- I have been provided with a copy of the Policy, Procedure, Protocol or Guideline described above.
- I have read the Policy, Procedure, Protocol or Guideline document and agree the content
- I approve the Policy Procedure, Protocol or Guideline for implementation

Signature: Mary Clare Hayes **Date:** 23/8/18
Ms. Mary Clare Hayes
CNS Infection Control and Prevention

25 Appendix XIV Key Stakeholders Review of Policy, Procedure Protocol or Guideline

Reviewer: The purpose of this statement is to ensure that a Policy, Procedure, Protocol or Guideline (PPPG) proposed for implementation is circulated to Managers of Employees who have a stake in the PPPG. You are asked to sign this form to confirm to the committee developing this Policy or Procedure or Protocol or Guideline that you have reviewed and agreed the content and approve of the following Policy, Procedure, Protocol or Guideline for use within the organisation

Guideline for Undertaking Peripheral Intravenous Cannulation in Adults

I acknowledge the following:

- I have been provided with a copy of the Policy, Procedure, Protocol or Guideline described above.
- I have read the Policy, Procedure, Protocol or Guideline document and agree the content
- I approve the Policy Procedure, Protocol or Guideline for implementation

Signature: Helen Butler **Date:** 25/10/18
Ms. Helen Butler
Director of Nursing

Signature: Garry Courtney **Date:** 25/10/18
Professor Garry Courtney
Clinical Director

Signature: [signature] **Date:** 26/10/18
Dr. Rory McGovern
Consultant Physician and Geriatrician

26 Appendix XV Signature Sheets

I have read, understand and agree to adhere to the attached Policy, Procedure, Protocol or Guideline.

Print Name	Signature	Area of Work	Date

Signature Sheets

I have read, understand and agree to adhere to the attached Policy, Procedure, Protocol or Guideline.

Print Name	Signature	Area of Work	Date