East Sussex Healthcare
NHS Trust

FOI REF: 26/415

Eastbourne District General Hospital
Kings Drive
Eastbourne
East Sussex
BN21 2UD

Tel: 0300 131 4500
Website: www.esht.nhs.uk

8th September 2026

Further to your recent request for information made under the Freedom of Information Act (FOIA) 2000, I now set out our answers to your specific questions, and any clarifications sought and provided, as follows:

I would be grateful if you could please disclose the following:

1. Trust policy regarding the management of IV cannulae.

Please see attached the following documents:

- Peripheral Venous Cannulation Police and Competency Guidelines - document number '00161_03.01_P'.
- Guidelines for Ultrasound Peripheral Intravenous Cannulation - document number '00563_03_P'.

2. Trust policy regarding iron infusion management.

Please see attached the following documents:

- Intravenous Iron Supplementation - Adult Prescribing and Administration Guidelines - document number '00863_02.01_P'.
- Clinical Guideline '01472_01_P'.
- Iron Deficiency Treatment Pathway Guideline - document number '02628_P'.

Please note that it is the Trust's FOI policy to only provide the names of staff that are graded at Band 8a (senior staff) or above, and therefore the names of staff at Band 7 and below have been redacted from the attached document.

Please also note we are applying Sections 31(1)(a), 40(2) and 44 as we have redacted the names of the Trust's IT Systems, staff that no longer work for the Trust, names of individuals that do not work for the Trust, IT System Screen Shots and any reference to direct email addresses and phone numbers, as set out below:

Section 31(1)(a)

Under Section 31(1)(a) of the Freedom of Information Act (FOIA), the Trust can confirm that it holds information relevant to your request, however, we are unable to disclose it for the reasons explained below.

Historically, we would disclose information relevant to the Trust's IT systems, infrastructure and software as part of our transparency agenda under the terms of the Freedom of Information Act (FOIA). However, in light of the recent cyber-attacks on NHS hospitals and the serious impact these have had on patient services and the loss of patient data, we are having to reconsider this approach. Please see several links to news articles about these recent cyber incidents provided below for your information.

- *NHS England — London » Synnovis Ransomware Cyber-Attack*
- *NHS England confirm patient data stolen in cyber attack - BBC News*
- *Merseyside: Three more hospitals hit by cyber attack - BBC News*

As a result of these attacks, thousands of hospital and GP appointments were disrupted, operations were cancelled, and confidential patient data was stolen which included patient names, dates of birth, NHS numbers and descriptions of blood tests.

When we respond to a Freedom of Information request, we are unable to establish the intent behind the request. Disclosure under the FOIA involves the release of information to the world at large, free from any duty of confidence. Providing information about our systems or security measures to one person is the same as publishing it for everyone. While most people are honest and have no intention of misusing information to cause damage, there are criminals who look for opportunities to exploit system weaknesses for financial gain or to cause disruption.

In the context of the FOIA, the term ''public interest'' does not refer to the private or commercial interests of a requestor; its meaning is for the "public good". The Trust receives a significant number of requests each year regarding our IT systems, infrastructure and cyber security measures. Most of these requests are commercially driven and serve no direct public interest. Information relevant to our IT portfolio is often requested by consultancy companies who then pass on this information to their client base. Many of these requests are submitted through the FOI portal whatdotheyknow.com who publish our responses, making this information available to an even wider audience.

As a large NHS Trust we hold extensive personal data relevant to our patients and staff, much of which is considered very sensitive. A lot of this information is held electronically on various administration and clinical systems. We have a duty under the Data Protection Act 2018 and the UK GDPR to protect this personal information and take all necessary steps to ensure this data is kept safe. This means not disclosing information that could allow criminals to gain unlawful access to our systems and infrastructure. The Trust can be heavily fined should it be found to have acted in a negligent way which results in a personal data breach. We need to

demonstrate that we comply with our legal obligations under data protection and freedom of information legislation, but we must be careful that too much transparency does not result in harm to our patients or staff, or cause disruption to our services.

Moreover, under the Network and Information Systems (NIS) Regulations Act 2018, operators of essential services such as NHS organisations like ours have a legal obligation to protect the security of our networks and information systems in order to safeguard our essential services. By releasing information that could increase the likelihood or severity of a cyber-attack, the Trust would fail to meet its security duties as stated in Section 10 of the Network and Information Systems Regulations 2018. Should we not comply with these requirements regulatory action can be taken against the Trust. Further information about the Network and Information Systems (NIS) Regulations Act 2018 can be found here – The Network and Information Systems Regulations 2018: guide for the health sector in England - GOV.UK

Your request asks for policy documents which unfortunately mention specific details regarding our IT Systems which, for the reasons explained above, would be inappropriate to release into the public domain. If disclosed, it is possible that patient data as well as other confidential information would be put at risk. Such disclosure could also impact on the security of our systems and result in serious disruption to the health services we deliver to the local community. Section 31(1)(a) of FOIA provides that information is exempt if its disclosure would, or would be likely to, prejudice (a) the prevention or detection of crime. In this case, disclosure would be likely to prejudice the prevention of crime by enabling or encouraging malicious acts which could compromise the Trust's IT systems and infrastructure. The Trust's capacity to defend itself from such acts relates to the purposes of crime prevention and therefore Section 31(a) exemption is applicable in these circumstances. For these reasons, the Trust considers disclosure of the information you are seeking to be exempt under Section 31(1)(a) [law enforcement] of the FOIA and the names of the IT systems within the policy is being withheld. The full wording of Section 31 can be found here: Freedom of Information Act 2000

Section 31 is a qualified exemption and therefore we must consider the prejudice or harm that may be caused by disclosure of the information you have requested, as well as apply a public interest test that weighs up the factors in maintaining the exemption against those in favour of disclosure.

In considering the prejudice or harm that disclosure may cause, as explained should the Trust release information into the public domain which draws attention to any weaknesses relevant to the security of our systems or those of a supplier, this information could be exploited by individuals with criminal intent. Increasing the likelihood of criminal activity in this way would be irresponsible and could encourage malicious acts which could compromise our IT systems or infrastructure, result in the loss of personal data and/or impact on the delivery of our patient services. We consider these concerns particularly relevant and valid considering the increasing number of cyber incidents affecting NHS systems in recent years and the view by government, the ICO and NHS leaders that the threat of cyber incidents to the public sector is real and increasing.

- *Organisations must do more to combat the growing threat of cyber attacks | ICO*

In the Government's Cyber Security Strategy 2022-2030, the Chancellor of the Duchy of Lancaster and Minister for the Cabinet Office states on page 7:
"Government organisations - and the functions and services they deliver - are the cornerstone of our society. It is their significance, however, that makes them an attractive target for an

ever-expanding army of adversaries, often with the kind of powerful cyber capabilities which, not so long ago, would have been the sole preserve of nation states. Whether in the pursuit of government data for strategic advantage or in seeking the disruption of public services for financial or political gain, the threat faced by government is very real and present.

Government organisations are routinely and relentlessly targeted: of the 777 incidents managed by the National Cyber Security Centre between September 2020 and August 2021, around 40% were aimed at the public sector. This upward trend shows no signs of abating."

With this in mind, we then considered the public interest test for and against disclosure. It should be noted that the public interest in this context refers to the public good, not what is 'of interest' to the public or the private or commercial interests of the requester. In this case we consider the public interest factors in favour of disclosure are:

- Evidences the Trust's transparency and accountability
- Provides information relevant to the IT systems and applications the Trust uses
- Reassures the public and partners that the Trust procures these systems in line with Procurement legislation
- Reassures the public and partners that the Trust's IT infrastructure and systems are secure

Factors in favour of withholding this information are:

- Public interest in crime prevention
- Public interest in avoiding disruption to our health services
- Public interest in maintaining the integrity and security of the Trust's systems
- Public interest in the Trust avoiding the costs associated with any malicious acts (e.g. recovery, revenue, regulatory fines)
- Public interest in complying with our legal obligations to safeguard the sensitive confidential information we hold

In considering all of these factors, we have concluded that the balance of public interest lies in upholding the exemption and not releasing the information requested. Although disclosure would provide transparency about our software systems and IT infrastructure, this is outweighed by the harm that could be caused by people who wish to use this information to assess any vulnerabilities in our security measures and consequently use this information for unlawful purposes. Cybercrime can not only lead to major service disruption but can also result in significant financial losses. As a publicly funded organisation, we have a duty for ensuring our public funding is protected and spent responsibly. Moreover, as a public body the Trust must demonstrate that it keeps its confidential data and IT infrastructure safe and complies with relevant legislation, but at the same time we must be vigilant that transparency does not provide an opportunity for individuals to act against the Trust. In considering the impact that recent cyber-attacks have had on NHS services, including the cancellation of thousands of patient appointments and procedures as well as the loss of confidential patient data, we consider the overriding public interest lies in withholding this information. The private

or commercial interests of a requester should not outweigh the public interest in protecting the integrity of our systems and continuity of our essential patient services. Although we appreciate there may be legitimate intentions behind requesting this information, we must take a cautious approach to requests of this nature and appreciate your understanding in this matter.

Section 40(2)

I can confirm that we hold this information, but it is exempt under Section 40(2) of the Freedom of Information Act 2000 – Personal Information of third parties. This is because this information may allow the identification of individuals and disclosure would breach the principles of the Data Protection Act.

This is an absolute exemption and therefore carries no requirement to consider the public interest.

Section 44

We are unable to provide the contact details of staff as we consider this information to be exempt from release in accordance with Section 44 of the Freedom of Information Act (Prohibition on Disclosure) and would refer to the Privacy and Electronic Communications EC Directive Regulations 2003 which provide specific rules on electronic communication services, including marketing (by phone, fax, email or text) and keeping communications services secure. We will not provide any information that could result in the transmission of unsolicited communications which may place an unacceptable risk to our email network and could also have a detrimental impact on patient care and treatment.

The contact number for the Trust is accessible on the Trust website http://www.esht.nhs.uk.

This is an absolute exemption and therefore carries no requirement to consider the public interest.

I trust this information is helpful in its detail or explanation however, if you are dissatisfied with the response, then you have the right to request an internal review. If you wish to seek an internal review, please write to the Freedom of Information Team at esh-tr.foi@nhs.net quoting the above FOI reference number, within 40 working days. Please note the Trust is not obliged to accept a request for an internal review after this time period.

Yours faithfully

Freedom of Information (FOI) Team
East Sussex Healthcare NHS Trust
0300 131 4716
Core Hours of Business: Monday to Friday 9.00am to 4.00pm

East Sussex Healthcare NHS Trust

Peripheral Venous Cannulation Policy and Competency Guidelines

Document ID Number	161
Legacy ID Number	775
Version:	V3.1
Ratified by:	Core Services Quality and Governance Group
Date ratified:	July 2025
Name of author and title:	[redacted], Vascular Access Team Lead Nurse
Date originally written:	November 2009
Date current version was completed	July 2025
Name of responsible committee/individual:	Vascular Access Team Lead Nurse
Division and Specialty	Core Services – Vascular Access
Date issued:	21 July 2025
Review date:	July 2028
Target audience:	All Trust clinical staff who perform peripheral venous cannulation
Compliance with CQC Fundamental Standard	Safe care and treatment.
Compliance with any other external requirements (e.g. Information Governance)	NICE Guidance QS61
Associated Documents:	Aseptic Non Touch Technique (ANTT) Policy National Infection Prevention and control Manual for England Decontamination of non-invasive, reusable equipment policy Consent to Treatment, Examination and Care Policy and Procedure Policy for the Identification of Patients

Did you print this yourself?
Please be advised the Trust discourages retention of hard copies of the procedural document and can only guarantee that the procedural document on the Trust website is the most up-to-date version

Version Control Table

Version number and issue number	Date	Author	Reason for Change	Description of Changes Made
V2.0	March 2020	[redacted] Vascular Access Specialist Practitioners.	Update and Policy expiry.	Update for Brighton University Students practicing Cannulation.
V.3.0	February 2025	[redacted] Vascular Access Team Lead	Review and update, policy expiry	EHRA form replaced with EHIA – title change from Multi-Professional Practice Guideline for Peripheral Intravenous Cannulation Competency
V3.1	August 2025	[redacted] Lisa Redmond	National Patient Safety Alert: NatPSA/ 2025/002/UKHSA	Statement added when 2% chlorhexidine mentioned and Appendix G added

Consultation Table
This document has been developed in consultation with the groups and/or individuals in this table:

Name of Individual or group	Title	Date
Dee Daly	Head of Governance, Core Services	July 2025
Lisa Redmond	Head of Infection Prevention and Control	August 2025

This information may be made available in alternative languages and formats, such as large print, upon request. Please contact the document author to discuss.

Table of Contents

1. Introduction

Many patients admitted to hospital will need to have an insertion of a peripheral intravenous cannula or vascular access device (VAD) for the delivery of treatment e.g. medications or fluids, or there is anticipation of treatment being required via the intravenous route.

Increasingly the insertion of a peripheral intravenous cannula (PIC) is being delegated to key competent practitioners including registered nurses, midwives, radiographers, operating department practitioners and support practitioners, to ensure that patients receive timely and effective treatment.

2. Purpose

Intravenous cannulation, although a routine procedure, is an enhanced practice when carried out by registered nursing, midwifery staff and clinical support practitioners. This guideline is to show the correct method for carrying out PIC insertion, and provides local notes on practice.

This document also outlines the specific knowledge, skills and competencies to be achieved by all practitioners who undertake cannulation whilst working for East Sussex Healthcare Trust.

2.1 Scope

This policy applies to all registered nurses and midwives, registered operating practitioners, radiographer staff, clinical support practitioners, doctors who have received appropriate training, healthcare assistants working in acute unit with support from the unit manager/matron. Final year nursing students will be under the direct supervision of their mentors who are skilled in this procedure.

3. Definitions

Peripheral line placement, also referred to as peripheral venous or intravenous (IV) cannulation, is the insertion of an indwelling single-lumen plastic conduit across the skin into a peripheral vein. Such devices may be referred to as peripheral IV (or venous) lines, cannulas, or catheters. It is performed using aseptic technique, to reduce the risk of contamination.

4. Accountabilities and Responsibilities

4.1 All practitioners who have attended the Trust's Cannulation study session will undergo a Competency Based Assessment using the Trust's documentation and Competency Assessment tool. Competence will be authorised by a designated assessor (from the appropriate area) who is competent in cannulation practice and is qualified to assess staff, preferably holding a recognised assessor's qualification.

4.2 Candidates must practice, complete and record supervised practice (competencies) and submit the completed form their line manager and Integrated Education to enter onto [redacted].

4.3 The unit manager/matron or equivalent will identify those practitioners who will carry out peripheral venous cannulation and who will be responsible for maintaining training and competency records for designated staff. The unit manager/matron will also

be responsible for sending copies of records of cannulation training and assessment to Integrated Education for entry on to the Trust's database.

4.4 Vascular Access Specialist Practitioners will conduct teaching sessions via Integrated Education. It comprises of the legal aspect of the practitioner, infection prevention and control, health and safety measures, anatomy and physiology of the veins, arteries and nerves, site selections and cannulation techniques. The candidate will be provided with monitoring/competency compliance documents and a contract to carry out cannulation. (See Appendices)

4.5 All practitioners undertaking this procedure must maintain their practice in line with Trust policy and the NMC Code of Professional Conduct (2018) or relevant professional body, if applicable.

4.6 East Sussex Healthcare Trust staff that are deemed competent to carry out this procedure must adhere to the Royal College of Nursing (RCN) Standards for infusion Therapy 4th edition 2016

See also Section 7: Competencies and Training Requirements

5. Process

5.1 Procedures - Equipment

- Isopropyl alcohol 70%, Chlorhexidine 2% licensed applicator (**Do not use non-sterile alcohol-free wipes for this procedure).** See Appendix G for visualisation of the products purchased by ESHT and their appropriate use
- Sterile towel
- Absorbent pad
- Non-sterile latex free gloves (well fitting)
- Single Use, Disposable Tourniquet.
- Sharps container & hard surface plastic tray (cardboard kidney dishes are not a viable or safe substitute).
- Clinical waste bag
- Cannula of a type and size suitable for the needs of the patient
- Needle free connector
- 10ml Sodium Chloride 0.9% pre-filled syringe
- Fixative dressing

5.2 Technique

- Clean hands before approaching patient space; Moment of hand hygiene.
- Ask the patient to confirm their identity by giving their name and date of birth. If an in-patient, check details against the wrist band.
- Explain the reason for the procedure, allowing time for discussion of any queries.
- Gain verbal consent where practicable, or demonstrate advocacy, before commencing the procedure.
- Position the patient comfortably.
- Select required equipment.
- Consider examination of both arms.
- Wash hands with soap and water and dry well.
- Cover any breaks in skin integrity with waterproof dressing.
- Don gloves.

- Position yourself comfortably and ensure equipment is within easy reach with the sharps bin no further than an arm's length away.
- Apply a single use tourniquet approximately in the middle of the upper arm.
- Ascertain integrity of veins by look and feel, avoiding small superficial veins.
- Select a vein, preferably one which is showing no signs of previously being used, easily detectable by palpation, feeling soft and bouncy.
- Remove tourniquet.
- Open out equipment onto a clean field. Place absorbent pad under patient's arm.
- decontaminate the area of the arm thoroughly with Chlorhexidine 2% Isopropyl alcohol 70% applicator, inside to out for a minimum of 30 seconds and allow to dry. (**Do not use non-sterile alcohol-free wipes for this procedure).** See Appendix G for visualisation of the products purchased by ESHT and their appropriate use.
- Reapply tourniquet.
- Anchor vein by gently pulling back the skin a few centimetres below proposed puncture site.
- Warn patient of needle entry, then insert gently into selected vein at an angle of 10 – 45 degrees.
- Insert cannula and observe for initial blood in the flashback chamber.
- Lower angle of cannula and stylet, and advance 2mm.
- Advance cannula, note secondary flashback along the cannula.
- Release tourniquet.
- Apply digital pressure beyond cannula tip to minimise blood spillage if using a ported cannula, be mindful not to contaminate the cannula exit site.

N.B. Nexiva integrated cannula have a safety no blood exposure cap so there is no need to apply digital pressure.

- Remove stylet and dispose of in sharps container.
- Apply clamp to integrated extension set and remove the air outlet anti blood spillage port.
- Attach needle-less connector.
- Flush the first cannula needle free connector with 5-10mls 0.9% Sodium Chloride in a pre-filled 10ml syringe.
- Secure the cannula with appropriate Trust recommended IV dressing.
- Clean the second needle free bung if it has come into contact with the environment with a 2% chlorhexidine 70% alcohol wipe, and flush the second port. (**Do not use non-sterile alcohol-free wipes for this procedure).** See Appendix G for visualisation of the products purchased by ESHT and their appropriate use.
- Ensure the date has been recorded on the dressing.
- Remove and discard gloves as clinical waste (tiger bag).
- Check that the patient is well and comfortable.

Inform the patient that the procedure is completed.

Wash or alcohol sanitise hands between patients. If patients have infectious disorders e.g. C.Diff +ve, then handwashing between patients is essential.

Clean the plastic tray with soap and water wipes.

Document the procedure on electronic patient record [redacted] under Assessment Vascular Access: Peripheral Vascular Access Documentation (PVAD) form. Please also document in the patient notes if the insertion was complex and why.

6. Evidence Base/References

Mental Capacity Act 2005 HMSO; London

NICE Guidance: 2014, Quality Standards QS61 Statement 5 – Vascular Access Devices

Royal College of Nursing Standards for Infusion Therapy 4th edition, 2016

7. Competencies and Training Requirements

7.1 All non-medical staff undertaking peripheral venous cannulation must have attended a cannulation course or a combined venepuncture and cannulation course run or commissioned by East Sussex Healthcare NHS Trust, followed by supervised practice and successful assessment of competence, prior to practice in their respective clinical area. See Appendices B – F.

7.2 Vascular Access Specialist Practitioners will conduct in-house teaching sessions or commission training via vascular access device suppliers with Integrated Education. The cannulation course comprises of the legal aspect of the practitioner, infection prevention and control, health and safety measures, anatomy and physiology of the veins, arteries and nerves, site selections and cannulation techniques. Theory and knowledge regarding cannulation is usually provided through an online interactive learning module that needs to be completed before attending the practical session. The Practical session allows the practitioner to apply the knowledge from the online sessions in a classroom. The candidate will be provided with monitoring compliance documents and a contract to carry out cannulation. All practitioners will need to secure a confident competent mentor, practice educator or vascular access champion in their clinical area who will support them after the cannulation course to competence.

The training can be combined with the venepuncture training which is a stand-alone module and practical session that have to be registered for separately. This is consolidated by supervised practical experience and formal competency assessment in the clinical areas.

In circumstances where despite training and continued support, the practitioner has not achieved competency, this should be discussed with and reviewed by the relevant manager for appropriate action.

Cannulation is no longer considered an advanced skill if required in the clinical areas where a registered practitioner works. Practitioners who cannulate but are not registered healthcare professionals will be operating under the direction of a registered practitioner on duty.

7.3 For practitioners (excluding Doctors) commencing with the Trust who have previously undertaken training and practice of cannulation with another employer within the last two years, evidence of the training should be provided together with supporting evidence, for example competency records, reflective journals etc. These must be produced for the practitioner's line manager, who will keep a copy and upload to [redacted] via Integrated Education, and authorise the practitioner to cannulate, or to access further training where deemed appropriate. Any Trust employee wishing to start

practicing this procedure will undertake ten cannulation procedures supervised by a designated assessor and recorded on the Trust documentation.

7.4 All doctors new to the Trust, and doctors in training, are required to complete a competency-self assessment within one week of commencing with the Trust for (CNST) Clinical Negligence for Trust and risk management purposes; cannulation is included as a core skill. Where additional training needs are identified, for example, at appraisal, doctors may apply via Integrated Education, and should be practically assessed at the discretion of their Educational Advisor or Lead Consultant.

7.5 Student Nurses who have attended a face-to-face training seminar from their university may perform cannulation in adults, but always under the direct supervision of a Trust member of staff who holds competency in this skill. Students must read, understand and adhere to the processes set out in this policy.

7.6 Newly qualified Nurses are able to perform intravenous cannulation only if their University has deemed them competent and their line manager is confident they are strictly following Trust Policy and procedures correctly. If the line manager is concerned protocol is not being adhered to and or the Nurse is clinically unskilled, they must arrange for the Nurse to attend further training by the Vascular Access Team via Integrated Education.

7.7 All staff who cannulate have a responsibility to keep themselves up to date with the latest evidence-based practice. Practitioners are required to attend cannulation training update every 3 years, or sooner if there are concerns about practice. Update training is split into two categories, Integrated Education will ask you to confirm you are regularly cannulating and feel competent, if so the practitioner need only attend the online update. If the candidate is not cannulating regularly, lost confidence or has been out of practice for an extended period, the practitioner will be asked to declare this and attend both the online training and the practical training session. Registered practitioners in line with their code of conduct will be responsible for keeping themselves up to date. Practitioners who are not registered healthcare professionals will be expected to keep up to date, with support from the line manager or registered practitioner who oversees the clinical area.

8. Monitoring Compliance with the Document

Monitoring Table

Element to be Monitored	Lead	Tool for Monitoring	Frequency	Responsible Individual/Group/ Committee for review of results/report	Responsible individual/ group/ committee for acting on recommendations/action plan	Responsible individual/group/ committee for ensuring action plan/lessons learnt are Implemented
Potential source of infection	Vascular Access Team, Infection Prevention and Control Team	Root Cause Analysis, audit and report	Ongoing	Core Services Quality & Governance Group	Core Services Quality & Governance Group	Vascular Access Team Ward matrons, unit managers or equivalent
Needle stick injury.	VAT Lead	[redacted] reports	On occurrence	Occupational Health Team	Core Services Quality & Governance Group	Vascular Access Team Ward matrons, unit managers or equivalent
Adhering to best practice	VAT Lead	Audit	Annually	Core Services Quality & Governance Group	Core Services Quality & Governance Group	Vascular Access Team Ward matrons, unit managers or equivalent

9. Equality and Health Inequalities Impact Assessment Statement

This policy has been assessed for its impact on equality and health inequalities, ensuring it provides equitable care across all patient groups. An Equality Impact Assessment has been completed and can be found in Appendix A.

Appendix A: Equality and Health Inequalities Impact Assessment (EHIA)

SECTION A: ADMINISTRATIVE INFORMATION

This form is a central part of how the Trust makes sure and can demonstrate to others that we are meeting our legal duties; and how we can assure ourselves that all patients will get the best outcome for them from our services.

. **Function/policy/service name and number:**	Peripheral Venous Cannulation Policy and competency Guidelines V3.0 (Document ID: 775)		
Main aims and intended outcomes of the function/policy/service and summary of the changes you are making (if existing policy/service):	The policy aims to ensure safe, consistent and competent Peripheral Venous (PV) Cannulation practices by clinical staff at ESHT. It outlines training requirements, procedural steps, and competency assessments to safeguard patients and reduce risks.		
How will the function/policy/service change be put into practice?	- By providing mandatory training and competency assessments for staff - Regular updates to align with current standards and practices - Routine monitoring of compliance through incident reports and audit		
Who will be affected/benefit from the policy?	- Clinical staff undertaking PV Cannulation - Patients requiring PV Cannulation for therapeutic purposes		
State type of policy/service	Policy ☐ **X**	Service ☐ **X**	
	Business Case ☐	Function ☐	Existing **X**
Is an EHIA required? NB :Most policies/functions will require an EA with few exceptions such as routine procedures	Yes ☐ **X**		
	No ☐ (If no state reasons)		
Accountable Director: (Job Title)	CHIEF MEDICAL OFFICER		
Assessment Carried out by:	[redacted]		
Contact Details:	[redacted]		
Date Completed:	19th May 2025		

SECTION B: ANALYSIS AND EVIDENCE

Analysis of the potential impact – Equality and Health Inequalities Duties

3. PROTECTED CHARACTERISTICS - Main potential positive or negative impact of the proposal for protected characteristic groups

Protected characteristic groups	Summary explanation of the *potential* positive or adverse impact of your proposal	How do you know this? (include here a brief explanation of what information you have used to identify potential adverse impact e.g. NICE guidance, local data, evidence reviews, stakeholder or patient feedback	Action that will be taken to address the potential for negative impact.
Age: older people; middle years; early years; children and young people.	Elderly patients and children may require specific techniques due to vein fragility or size	Staff and patient feedback	Include guidance in training and competency assessments
Disability: physical, sensory and learning impairment; mental health condition; long-term conditions.	Patients with disabilities may face barriers in communication or positioning during procedures	NICE guidance and patient feedback	Provide accessible communication methods and ensure appropriate support for positioning. Individualised assessment and care.
Gender Reassignment and/or people who identify as Transgender	No specific impact identified	Policy uniformly applies to all genders	N/A
Marriage & Civil Partnership: people married or in a civil partnership.	No specific impact identified	Policy uniformly applies	N/A
Pregnancy and Maternity: before and after childbirth and who are breastfeeding.	Pregnant patients may face unique risks due to vascular changes	Local clinical feedback and staff observations	Include specific considerations in training for cannulation during pregnancy

Protected characteristic groups	Summary explanation of the *potential* positive or adverse impact of your proposal	How do you know this? (include here a brief explanation of what information you have used to identify potential adverse impact e.g. NICE guidance, local data, evidence reviews, stakeholder or patient feedback	Action that will be taken to address the potential for negative impact.
Race:	Language barriers may impact communication and consent for non-native English speakers. Effective venepuncture technique required for patients of all skin tones.	Patient complaints and Healthwatch feedback	Use interpreters and translated materials to facilitate communication Teach palpation technique for vessel identification as standard.
Religion and belief: people with different religions/faiths or beliefs, or none.	No specific impact identified	Policy uniformly applies	N/A
Sex:	No specific impact identified	Policy uniformly applies	N/A
Sexual orientation	No specific impact identified	Policy uniformly applies	N/A
Veterans/Armed Forces Communities	Veterans may present with vascular challenges due to prior injuries or medical conditions	Feedback from Armed Forces Covenant Duty considerations	Individualised assessment when cannulating

4. HEALTH INEQUALITIES -Potential positive or adverse impact for people who experience health inequalities summarised

Groups who face health inequalities[1]	Summary explanation of the potential positive or adverse impact of your proposal	How do you know this? (include here a brief explanation of what information you have used to identify potential adverse impact e.g. NICE guidance, local data, evidence reviews, stakeholder or patient feedback	Action that will be taken to address the potential for negative impact.
This includes all groups of people who may have poorer access to or outcomes from healthcare services. It includes: People who have experienced the care system; carers; homeless people; people involved in the criminal justice system; people who experience substance misuse or addiction; people who experience income or other deprivation; people with poor health literacy; people living in rural areas with limited access to services; refugees or asylum seekers; people in or who have been in the armed force; other groups who you identify as potentially having poorer access and outcomes.	*See below*		

Breakdown of Groups who are more likely to experience health inequalities:

Groups who face health inequalities[2]	Summary explanation of the potential positive or adverse impact of your proposal	How do you know this? (include here a brief explanation of what information you have used to identify potential adverse impact e.g. NICE guidance, local data, evidence reviews, stakeholder or patient feedback	Action that will be taken to address the potential for negative impact.
Carers of patients	Carers may require guidance on the process to support patients and reduce anxiety	Patient and carer surveys	Provide information to explain procedures, and give reassurance
Homeless people. People on the street; staying temporarily with friends /family; in hostels or B&Bs.	No impact identified. Inequalities in access to services are of separate consideration		
People involved in the criminal justice system: offenders in prison/on probation, ex-offenders.	No impact identified.		
People with addictions and/or substance misuse issues	Risk of damaged veins or reduced compliance	Clinical feedback and NICE guidelines	Provide specialised training for staff to address these challenges. Individualised assessment and care
People with poor literacy or health Literacy: (e.g. poor understanding of health services poor language skills).	Difficulty understanding procedure details or consent process	Data on local health literacy levels	Simplify patient-facing materials with visual aids and plain language

Groups who face health inequalities[2]	Summary explanation of the potential positive or adverse impact of your proposal	How do you know this? (include here a brief explanation of what information you have used to identify potential adverse impact e.g. NICE guidance, local data, evidence reviews, stakeholder or patient feedback	Action that will be taken to address the potential for negative impact.
People living in deprived areas	No impact identified.		
Refugees, asylum seekers or those experiencing modern slavery	Language barriers and unfamiliarity with healthcare systems	Local refugee group feedback	Provide multilingual materials and access to interpreters Individual assessment of needs
People who have served in the Armed Forces	See above		

SECTION C: ENGAGEMENT

5. Engagement and consultation

a. Talking to patients, families and local communities can be a rich source of information to inform health care services. If you are making substantial changes it's likely that you'll have to undertake specific engagement with patients. For smaller changes and policies your may have undertaken some engagement with patient groups, gained insight from routine sources e.g. patient surveys, PALS or Complaints information or information from Healthwatch, you may also have looked at relevant engagement that others have undertaken in the Trust, or locally
Have any engagement or consultative activities been undertaken that considered how to address equalities issues or reduce health inequalities? Please place an x in the appropriate box below.

Yes	**No X**

b. If yes, please ensure all stakeholders are listed in the consultation table at the beginning of the policy.

SECTION D: SUMMARY OF FINDINGS

Reflecting on all of the information included in your review-

6. EQUALITY DUTIES: Is your assessment that your proposal will support compliance with the Public Sector Equality Duty? Please **add an x** to the relevant box below.

	Tackling discrimination	Advancing equality of opportunity	Fostering good relations
The proposal will support?	X	X	X
The proposal may support?			
Uncertain whether the proposal will support?			

7. HEALTH INEQUALITIES: Is your assessment that your proposal will support reducing health inequalities faced by patients? Please add an x to the relevant box below.

	Reducing inequalities in access to health care	Reducing inequalities in health outcomes
The proposal will support?	X	X
The proposal may support?		
Uncertain if the proposal will support?		

8. Outstanding key issues/questions that may require further consultation, research or additional evidence. Please list your top 3 in order of priority or state N/A

Key issue or question to be answered		Type of consultation, research or other evidence that would address the issue and/or answer the question
1	Outcomes for people with disabilities	Monitoring equity and outcomes for people with disabilities
2	Outcomes for high risk groups	Monitoring outcomes for high-risk groups, such as substance misuse patients
3	Communication for safety	Evaluation of interpreter service availability during cannulation

9. EHIA sign-off: (this section must be signed)

Person completing the EHIA:	[redacted]	**Date: 10/07/25**
Line Manager of person completing:	**Dee Daly**	**Date: 10/07/25**

Appendix B – EHIA Resources
Sources of Information on the East Sussex population and sources of community or patient insight.

Population Data
State of the County 2021 Focus on East Sussex

East Sussex JSNA

Community Insight

Further Reading on Equality and Health Inequalities

Training

Appendix B: IV Cannulation Procedure Competency Assessment Record Part One

Intravenous Cannulation Procedure Competency Assessment Record (Part One)

Record of Supervised Practice

Name	**Ward/Unit**	**Theory Session Date**
Hosp/Dept	**Date**	**Signature of Trainer**
Designated Supervisor	**Signature of Assessor**	**Print Assessor Name**

The section below should be used to maintain a record of the practitioner's skill on venepuncture. It should be completed for every occasion when the relevant skill is performed throughout the competency assessment phase.

According to Trust guidelines the practitioner should undertake a minimum of **5** supervised and **5** assessed procedures, prior to verification of competency to be recorded on **parts one and two** of the Trust's Competency Based Assessment record. A copy of the completed records should be held in the practitioner's file within the department. The original records should be held within the practitioner's portfolio.

Practitioners who have not performed this procedure within the last twelve months will undertake a further Competency Based Assessment authorised by a designated supervisor.

The practitioner should be able to provide sufficient evidence that they are maintaining their skills and this will be reviewed during their annual appraisal at the discretion of their manager.

	Procedure Details (Site/ Age of Patient/ other relevant information)	Comments	Witnessed by Assessor/ supervisor (PRINT)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Appendix C: IV Cannulation Competency Based Assessment Record (Part Two)

Intravenous Cannulation Procedure Competency Assessment Record (Part Two)

Assessment Record

Name	**Ward/Unit**	**Theory Session Date**
Hosp/Dept	**Date**	**Signature of Trainer**
Designated Supervisor	**Signature of Assessor**	**Print Assessor Name**

Competency Statement:
The practitioner will be able to consistently demonstrate competence in both clinical and theoretical knowledge regarding safe practice, technical skills and rationale for venepuncture procedures
The aim of this competency is to provide consistency in conjunction with a high standard of knowledge and practical skills across ESHT.

Evidence of competence:
Practitioners must be able to provide evidence to support claims of competence.
This evidence may take a number of forms including:
1. Supervision/observation conducted by other competent practitioners.
2. Supervision/observation conducted by the Designated Supervisor.
3. Learning logs of practice/procedures undertaken.
4. Reflective journals.

I confirm that the practitioner has
• Undertaken the minimum supervised procedures required
• Completed the relevant written documentation
• Is competent to perform venepuncture without further supervision.

Signature of supervisor: **Print Name:**
Date:

I feel competent in performing this procedure. Having received relevant training and completed the appropriate written documentation successfully, I accept full responsibility / accountability (delete as appropriate whether registered or unregistered) for my own practice and have discussed this role with my supervisor.

Signature of Practitioner: **Print Name:**
Date:
Date of reassessment:

Appendix D: Multi-Professional Intra-venous Cannulation of Adult Patients- Learning Outcomes Competency Based Assessment Tool

This list of key competencies is designed as a tool for the designated assessor who will supervise and assess individual practitioners.

The Practitioner is required to pass each of the identified competencies in order to complete their assessment and be deemed competent to practice independently.

Key: C-Clinical, P-Professional

	Performance Criteria-Knowledge, Skills and Attitudes	
1.	**Training and Specific Knowledge**	
	The practitioner	
1a.	Has attended the relevant mandatory training session	**P**
1b.	Demonstrates relevant knowledge of Anatomy and Physiology of the arms, hands, feet, vascular and integumentary systems	**C**
1c.	Demonstrates knowledge of appropriate cannula selection including gauge/flow rates etc.	**C**
1d	Demonstrates knowledge of correct usage of disposable tourniquet	**C**
1e	Demonstrates knowledge of site assessment tools including Vascular Infusion Phlebitis Score and Infiltration Scale	**C**
2.	**Role of the practitioner**	
2a.	Demonstrates a flexible and adaptable approach to their work	**P**
2b.	Understands the need to maintain and develop working practice in line with Code of Professional Conduct (NMC 2015) or relevant professional body	**P**
2c.	Understands the importance of liaison and co-operation with other members of the multi-disciplinary team	**P**
3.	**Accountability, Behaviour and Attitudes**	
	The practitioner	
3a.	Understands and observes patient confidentiality	**P**
3b.	Communicates and cares for patients in a professional manner	**P**
3c.	Understands the need to seek consultation following a second unsuccessful attempt to perform intra-venous cannulation	**P**
3d.	Has an awareness of the implications surrounding accountability issues and consent of patients and an awareness of the mental Capacity Act 2005	**P**
3e.	Demonstrates care and sensitivity to patients throughout the procedure to ensure minimal discomfort and anxiety	**P**
3f	Demonstrate non-judgemental attitude to patients with mental/physical disability and treat patients with utmost respect regardless of age, race, religious belief, gender and sexual orientation.	
4.	**Infection Control and Risk Management (including Health and Safety)**	
	The practitioner	
4a.	Understands ESHT universal precautions policy and other relevant infection control policies and guidelines	**P**
4b.	Understands ESHT sharps injury policy	**P**
4c.	Understands the need for effective hand hygiene techniques, the use of gloves and other Personal Protective Equipment (PPE) as appropriate	**C**
4d.	Demonstrates an effective sterile non touch technique during intra-venous cannulation procedure	**C**

4e.	Demonstrates effective skin preparation techniques and understands the importance of appropriate skin preparation	**C**
4f.	Can state the correct procedure in the event of blood spillage in line with Trust policy	**C**
4g.	Can demonstrate the correct use of the tourniquet and the risks associated with incorrect use	**C**
4h.	Disposes of materials and sharps safely in adherence with ESHT policy	**C**
4i.	Demonstrates knowledge of cannula in-dwell times and records information relating to cannula insertion in line with RCN Standards for Infusion Therapy (2005).	**C**
4j.	Can discuss the risks and hazards/complications of IV cannulation and take appropriate action	**C**
4k.	Recognises when it is inappropriate to perform IV cannula insertion and seeks assistance where necessary	**C**
4l.	Demonstrates knowledge of Trust Incident Reporting procedure	**P**
5.	**Intra-venous cannulation procedure**	
	The practitioner	
5a.	Demonstrates correct identification of the patient in accordance with ESHT policy	**P**
5b.	Obtains appropriate consent prior to performing procedure	**P**
5c.	Prepares patient and performs assessment as appropriate including assessment of the patients veins	**C**
5d.	Selects and prepares the correct equipment for the procedure	**C**
5e.	Demonstrates clean and safe skin preparation and the application of local and topical anaesthetics where prescribed	**C**
5f.	Applies and releases single use only disposable tourniquet correctly	**C**
5g.	Performs intra-venous cannula insertion safely in accordance with the manufacturers instructions	**C**
5h.	Secures cannula,` dates and dresses the site appropriately	**C**
5i.	Obtains venous samples from cannula only on insertion in line with RCN Standards 2011	**C**
5j.	Flushes cannula with 0.9% Sodium Chloride and administer correct volume (5 – 10 mls) using pulsated push-pause and positive pressure method using a 10 ml syringe	**C**
5k.	Despatches venous samples to the laboratory in adherence with Trust policy and procedure	**C**
5l.	Document procedure correctly on the PVAD document in patient's prescription chart	**P**
5m.	Uses needle-less connectors and needle free systems as appropriate in line with manufacturers instructions	**C**
5n.	Is aware that only one single use cannula shall be used for each cannulation attempt	**C**
5o.	Performs removal of IV cannula in adherence with RCN Standards, applies the appropriate occlusive dressing and records in patient's notes and on the PVAD form	**C**
6.	**Effective Troubleshooting and Risk Management**	
6a.	States the correct procedure for managing severe bruising or haematoma	**C**
6b.	Understands how to recognise and manage a punctured artery	**C**
6c.	Is able to recognise and manage a collapsed vein	**C**
6d.	Is aware of the differences between infiltration and extravasations and knows the appropriate action to take in relation to both incidents	**C**
6e.	Is aware of the implications of nerve contact	**C**

6f.	Understands how to encourage venous filling	**C**
6g.	Is able to recognise the signs and symptoms of phlebitis and take appropriate action	**C**
6h.	Is aware of the need to carry out regular site observations in line with RCN Standards using the appropriate assessment tools	**C**
6i.	Is able to confirm patency and take appropriate action in the event of transfixation or occlusion	**C**

Appendix E: Performance Criteria

Performance Criteria-Knowledge, Skills and Attitudes.	Signature of Supervisor	Date achieved
1. Training and Specific Knowledge		
The practitioner:		
a. Has attended the relevant mandatory training session		
b. Demonstrates relevant knowledge of Anatomy and Physiology of the arms, hands, vascular and integumentary systems		
c. Demonstrates knowledge of appropriate cannula selection including gauge/flow rates etc		
d. Demonstrates knowledge of site assessment tools including Vascular Infusion Phlebitis score and Infiltration score		
2. Role of the Practitioner		
a. Demonstrates a flexible and adaptable approach to their work:		
b. Understands the need to maintain and develop working practice.		
c. Understands the importance of liaison and co- operation with other members of the multi-disciplinary team.		
3. Accountability, Behaviour and Attitudes		
The Practitioner:		
a. Understands and observes patient confidentiality		
b. Communicates and cares for patients in a professional manner		
c. Understands the need to seek consultation following a second unsuccessful attempt to perform intravenous cannulation		
d. Has awareness of the implications surrounding accountability issues and consent of patients.		
e. Demonstrate non judgemental attitude to patients with mental/physical disability and treat patients with utmost respect regardless of age, race, religious belief, gender and sexual orientation		
Performance Criteria-Knowledge, Skills and Attitudes.	**Signature of Supervisor**	**Date achieved**

Appendix F: Infection Control and Risk Management

4. Infection Control and Risk Management (including Health and Safety)		
The Practitioner:		
a. Understands the ESHT universal precautions policy and other relevant infection control policies and guidelines		
b. Understands ESHT needlestick injury policy		
c. Understands the need for effective hand-washing techniques, the use of gloves and any other Personal Protective equipment (PPE) as appropriate		
d. Demonstrates an effective aseptic non touch technique during intravenous cannulation procedure		
e. Demonstrates effective skin preparation techniques and understands the importance of appropriate skin preparation		
f. Can state the correct procedure in the event of blood spillage in line with Trust policy		
g. Can state the correct use of the tourniquet and the risks associated with incorrect use		
h. Demonstrates knowledge of cannula in-dwell times and records information relating to cannula insertion in line with RCN Standards for Infusion Therapy (2003)		
i. Can discuss the risks and hazards/complications of IV cannulation and drug administration and take appropriate action		
j. Recognises when it is inappropriate to perform IV cannula insertion and seeks assistance where necessary:		
k. Demonstrates knowledge of Trust Incident Reporting procedure		
5. Intravenous cannulation procedure		
The Practitioner:		
a. Demonstrates correct identification of patient in accordance with ESHT policy		
b. Obtains and records appropriate consent before procedure		
c. Is able to prepare patient and perform assessment as appropriate including assessment of patients veins		
d. Is able to prepare the correct equipment for the procedure		
e. Is able to demonstrate clean and safe skin preparation and the application of local and topical anaesthetics where prescribed		
Performance Criteria-Knowledge, Skills and Attitudes	**Signature of Supervisor**	**Date achieved**
f. Is able to apply and release tourniquet correctly		
g. Is able to perform intravenous cannula insertion safely in accordance with the manufacturers instructions		
h. Is able secure cannula and apply appropriate dressing		

i. Is able to safely obtain venous samples from the cannula only on insertion in line with RCN Standards 2003		
j. Is able to flush cannula with appropriate prescribed solution and administer correct volume using pulsated push-pause and positive pressure method		
k. Is able to despatch samples to the laboratory in adherence with Trust policy and procedure		
l. Is able to administer flush according to RCN Standards 2003		
m. Documents procedure correctly on the PVAD form		
n. Uses needless connectors and needle free systems as appropriate in line with manufacturers instructions		
o. Is aware that only one single use cannula shall be used for each cannulation attempt		
p. The practitioner will remove the intravenous cannula in adherence with RCN Standards, applies appropriate occlusive dressing and records on PVAD		
6. Effective Troubleshooting, Risk Management and general cannula care		
The Practitioner:		
a. Is able to state the correct procedure for managing severe bruising or haematoma		
b. Is able to understand how to recognise and manage a punctured artery		
c. Is able to recognise and manage a collapsed vein		
d. Is aware of the implications of nerve contact		
e. Understands how to encourage venous filling		
f. Is aware to carry out regular site observation in line with RCN Standards using the appropriate assessment tools		
g. is able to confirm patency and take appropriate action in the event of transfixation or occlusion		

Appendix G: Poster – Are you using the right type of Chlorhexidine?

Are you using the right Types of Chlorhexidine Product for ANTT Cannulation, invasive procedure, IV medication administration or Blood Cultures?

NHS
East Sussex Healthcare
NHS Trust

BD Chloraprep 1ml Applicator, NHS supply chain code DMK000

Can be used for:

- Cannulation, Blood Cultures sampling, Bloods, injections, sub cut infusion/injection skin prep
- Note: PICC Dressings should use the 3mls applicator. NHS code: MRB306

Green 2% Chlorhexidine in 70% Alcohol devices wipes Product code: CA2C240 NHSSC: VJT638

- For needle free connector device cleaning (such as Bionector) NOT FOR CANNULATION
- Blood Culture Bottles tops, antibiotic or medication vial decontamination and others ANTT preparation

Blue Clinell 2% chlorhexidine skin wipes NHS Supply chain code VJT169

- For IM/SC injections
- For Routine Blood sampling NOT FOR CANNULATION

Clinell Alcoholic 2% Chlorhexidine Skin wipes are licensed for cleaning skin after dressing and plaster removal, especially where the dressing has caused dirt to develop.

Do not use non-sterile alcohol-free wipes for any Cannulation, Blood cultures, or decontamination before accessing or placing any Vascular Access.

Contact the Vascular Access Team via online referral for any further information or advice.

Created by Samantha Fowler VAT Support Practitioner 13/03/2023 update by Graham Howard Vascular Access Lead Nurse 06/02/2024 Updated 07/08/2025 Version 4

East Sussex Healthcare NHS Trust

Guidelines for Ultrasound Peripheral Intravenous Cannulation

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Date ratified:	August 2025
Name of author and title:	[redacted], Vascular Access Specialist Practitioner [redacted] Vascular Access Lead Nurse
Date originally written:	March 2018
Date current version was completed:	August 2025
Name of responsible committee/individual	Vascular Access Team Lead Nurse
Date issued:	19th August 2025
Review date:	August 2028
Target audience:	Healthcare professionals with an ability to use ultrasound techniques in real time. Vascular Access Team ESHT
Compliance with CQC Fundamental Standard	Safe Care and Treatment
Compliance with any other external requirements (e.g. Information Governance)	N/A
Associated Documents:	▪Aseptic Non Touch Technique (ANTT) Policy ▪National Infection Prevention and control Manual for England ▪Decontamination of non-invasive, reusable equipment policy ▪Consent to Treatment, Examination and Care Policy and Procedure ▪Policy for the Identification of Patients ▪Extravasation and Infiltration Management Policy

Did you print this yourself?
Please be advised the Trust discourages retention of hard copies of the procedural document and can only guarantee that the procedural document on the Trust website is the most up to date version

Version Control Table

Version number	Date	Author	Reason for Change	Description of Changes Made
1.0	March 2018	[redacted]	New Guideline	
2.0	September 2020	[redacted]	Review and update	Change to title; addition of Introcan cannulas and insertion techniques
3.0	August 2025	[redacted]	Policy update and renewal National Patient Safety Alert: NatPSA/ 2025/002/UKHSA	Update to Introcan observational notes. Addition of UK health security agency flow tree and rationale. Updated operation notes for Introcan insertion. Vessel Health preservation and NIVAS input. Additions to special considerations. Statement added when 2% chlorhexidine mentioned & Appendix F added

Consultation Table

This document has been developed in consultation with the groups and/or individuals in this table:

Name of Individual or group	Title	Date
Dr Alex Trimmings	Consultant Anaesthetist	June 2017
[redacted] and [redacted]	VAT Leads	December 2020
Zeki Atesli .	Emergency Dept. Consultant and Ultrasound Educator.	February 2025
Lisa Redmond	Head of Infection Prevention and Control	February 2025, August 2025
[redacted]	Vascular Access Team Lead	March 2025

This information may be made available in alternative languages and formats, such as large print, upon request. Please contact the document author to discuss.

Table of Contents

1. Introduction

More than ever, vascular access is expanding into many realms. With the increase in difficult venous access due to a range of clinical conditions, using ultrasound guided technique to access difficult veins is recommended.

Ultrasound guided peripheral intravenous cannulation (PIC) is the placement of a cannula into a peripherally located vein under the direct vision of ultrasound. This process allows the cannulation of veins that are otherwise unable to be visualised or palpated. In trained individuals, this method of cannulation results in higher first-pass and overall success rates with fewer complications.

2. Purpose

Ultrasound guided cannulation is an enhanced practice when carried out by registered nurses and clinical support practitioners. This guideline is to show the correct method for carrying out PIC under ultrasound guidance, and provides local notes on practice.

This document also outlines the specific knowledge, skills and competencies to be achieved by all practitioners who undertake this procedure whilst working for East Sussex Healthcare Trust.

2.1 Rationale

Peripheral cannulation is a routine invasive procedure. However, experienced practitioners and suitably qualified doctors may need to use other methods to access difficult veins, particularly in patients who are known to have difficult intravenous access.

Ultrasound cannulation should only be used among patients with difficult intravenous access and can be disadvantageous for patients are judged to have easy access (McCarthy et al 2015). Inadequate training or experience may lead to incorrect identification of structures, cause harm to the patient and lead to subsequent complications.

2.2 Principles

Vessel Health Preservation should be considered at all times. If ultrasound is needed to cannulate, feasibly an alternative venous access device may be appropriate depending on treatment durations, types of medications administered and the patency of veins. Clinical decisions for the appropriate route should be made by the multidisciplinary team.

Reducing the number of device insertions is key to improving patient outcomes. Selecting the right vascular access device for the right treatment at the right time and for the required treatment duration is essential. The risk of extravasation can be minimised by ensuring the most appropriate vascular access device is chosen (Meyer et al., 2020). A vascular access device decision-making tool can support this process by aligning device selection with the patient's intravenous treatment requirements (Ray-Barruel et al., 2020; Moureau & Chopra, 2016).

The UK Vessel Health and Preservation (VHP) Framework (Appendix D) has been developed to guide vascular access device assessment and selection (Hallam et al., 2020; Moureau, 2019). An important consideration in this process is the planned duration of IV therapy, which should not be confused with maximum indwell times. Ensuring alignment between treatment duration and device selection is crucial for optimising patient care and reducing complications.

In addition to selecting the correct device, where the device is placed also has a significant impact on patient outcomes. The insertion site should be carefully considered in relation to the intended therapy or diagnostic procedure. It is essential that those performing cannulation understand why they are inserting a cannula, as in some cases, peripheral ultrasound-guided cannulation may not be the most appropriate option. For certain treatments, central venous access may be the safer and more effective choice, reducing the risk of complications and ensuring treatment efficacy.

This is particularly important in oncology, where peripheral ultrasound-guided cannulation for cytotoxic therapy may increase the risk of extravasation and potential harm. Given the serious consequences, the multidisciplinary team (MDT), along with the patient, must carefully assess the risks and benefits of different vascular access options. Vessel health preservation should always be a priority to minimise complications and maintain long-term venous access integrity.

2.3 Scope

This policy applies to all registered operating practitioners, radiographer staff, the Vascular Access team (including support practitioners) and doctors who have received appropriate Ultrasound cannulation training.

3. Definitions

Ultrasound guided peripheral intravenous cannulation - The placement of a cannula into a peripherally located vein under the direct vision of ultrasound guidance.

Ultrasound imaging (sonography) uses high-frequency sound waves to view inside the body. Because ultrasound images are captured in real-time, they can also show movement of the body's internal organs as well as blood flowing through the blood vessels, with the use of a vascular or Doppler probe. Unlike X-ray imaging, there is no ionizing radiation exposure associated with ultrasound imaging. In an ultrasound exam, a transducer (probe) is placed directly on the skin or inside a body opening. A thin layer of gel is applied to the skin so that the ultrasound waves are transmitted from the transducer through the gel into the body. The ultrasound image is produced based on the reflection of the waves off of the body structures. The strength (amplitude) of the sound signal and the time it takes for the wave to travel through the body provide the information necessary to produce an image.

Vessel Health Preservation: Insertion of an intravascular access catheter is the most common invasive procedure performed with hospitalised patients. Selecting the right line for the right patient at the right time is vital to providing reliable vascular access as well as preserving the vasculature of the patient for future access needs. Timely, intentional proactive intervention for device selection within 24 hours and placement within 48 hours of admission into any acute facility provides for consistent access, reduced delays and improved patient satisfaction.

4. Accountabilities

All staff that uses the ultrasound probe using real time techniques for cannulation will be deemed accountable for their actions and subsequent care of the patient. There are also regulations as to care and maintenance of the probe and cable. Practitioners should be signed off as competent before use of the ultrasound for cannulation. *No attempts should be made to use ultrasound guided cannulation without appropriate training.*

5. Process

5.1 Referral and pre-assessment

Indications for Ultrasound cannulation
-Unable to visualise or palpate vein due to body habitus or oedematous skin
-Multiple unsuccessful blind insertion attempts
-Known vasopathic patients.
-Multiple previous cannulations/venepuncture.

Contraindications- no absolute contraindications but avoid intravenous cannulation if:
-Previous lymphedema, lymph node dissection of that limb
-Local burns, injury or infection

- Arterial/Venous Fistula in chosen arm.
- AV Shunt.
- Emergency situations in patients with low mean arterial pressure (MAP)

When it is identified that a patient will require an ultrasound guided cannulation a referral must be made to the Vascular Access Team, Eastbourne General District Hospital (EDGH) and Hastings Conquest Hospital (CONQ) or a clinically qualified doctor.

Pre-procedural evaluation:
-Review indication for peripheral cannulation
-Decide what gauge cannula to use
-Review relevant past medical history
-Can the patient give consent?

5.2 Preparation

Patient:
-Comfortable position, ideally lying flat as to promote satisfactory blood flow. Avoid Ultrasound cannulation in a chair or recliner
-Arm well supported, arm board (if available) with the limb abducted and externally rotated
-Adequate exposure for clean field

Operator:
-Ergonomically positioned: sitting or standing
-Align ultrasound monitor, patient and patient's peripheral access point within the operator's line of sight
-Equipment close, reachable and in order to be used

Equipment
-Ultrasound machine: linear transducer (7.5- 10MHz): superficial structure
: Curvilinear transducer (2 – 5 MHz): deeper structures
- Sterile Probe cover
-Sterile gel
-Dressing trolley
-Cannula: check required flow rate to determine gauge required
: Standard vs longer cannula dependant on the depth of vein being accessed
-Tourniquet; single use only/disposable
-Sterile Gloves are ideal in order to maintain sterility of the Ultrasound probe.
-Needle Free Connector
-Pre Filled 0.9% sodium chloride 10mls
-2% Chlorhexidine with 70% Isopropyl alcohol is required for skin preparation prior ultrasound guided peripheral intravenous cannulation. Do not use non-sterile alcohol-free wipes for this procedure. See Appendix F for visualisation of the products purchased by ESHT and their appropriate use.
-Transparent semi-permeable dressing (Trust prescribed).

5.3 Technique

Initial assessment

Aim to get the patient comfortable – ideally laying flat on bed or stretcher.
Ensure the arm is clean and free of any visible contamination

Use the ultrasound to survey the arm for potential vessels for cannulation using sterile gel. Venous targets are basilic, brachial and/or cephalic veins. The basilic vein, while variably present, lacks flanking arteries and nerves, and is usually the more superficial target.

In contrast the deep brachial vein has nerves and an artery in proximity and is found at a greater depth. Assessment should start below the antecubital fossa (ACF) and progress above the ACF if no suitable veins are found.

Confirm identified vessel is venous:

- Patent peripheral veins easily and completely collapse with gentle probe compression
- Non-pulsatile
- Colour Doppler can be used if available
- Pulsed wave Doppler also can be used to demonstrate the pulsatile flow pattern in adjacent arteries and the non-pulsatile, phasic flow in veins.

Appropriate vein:

- Large diameter, achievable depth, straight path
- No significant difference between more superficial veins at different depth
- Linear increase in success with increasing venous diameter
- Desirable targets are, therefore, found between 0.4cm and 1.5cm from the surface, with
- An internal diameter of at least 0.4cm.
- Note and avoid venous valves where possible. Also thrombosed veins can be easily identified via use of an Ultrasound scanner – a clot will identify as a white/greyish colour inside the vessel and will prevent the vessel walls collapsing together. Thrombosed veins must be avoided.

<u>Preparation:</u>

- Clean probe after initial scout
- Place a sterile probe cover directly on the clean probe, apply new sterile gel.
- Apply a tourniquet to the upper aspect of the patients arm
- Decontaminate the target area with 2% Chlorhexidine CHG + 70% Isopropyl Alcohol and allow to dry. Do not use non-sterile alcohol-free wipes for this procedure. See Appendix E for visualisation of the products purchased by ESHT and their appropriate use.

<u>Needle insertion</u>

- Use sterile gloves.
- Ultrasound probe held in non-dominant hand with stable grip, little finger as an anchor to prevent probe migration movement whilst the probe is in contact with the patient.
- Apply sterile gel.
- Check probe orientation: touch end of probe on the skin and watch for reaction on monitor to ensure orientation.
- Align for use on patient so that medial is medial and lateral is lateral.
- Relocate venous target.

<u>Probe approach:</u>

Transverse: advantages – improved ability to centre needle to midline of vessel.
Disadvantages – loss of direct needle tip visualisation each time the probe or needle are moved.

Longitudinal : advantages – entire needle visualised throughout procedure with better perception of depth within the vessel.
Disadvantages – inability to identify if needle is off the midline of the vessel. Please note that the longitudinal axis is for more clinically skilled and advanced practitioners.

Optional confirmation of position prior to insertion of needle by placing needle between transducer and skin to illicit shadow artefact. Note depth of vessel to approximate final insertion depth.

Insert needle through skin at a 45 degree approach angle. Concentrate on monitor after initial insertion. Find needle tip through fanning or small movements of ultrasound prior to further movement

Progressive targeted movement of needle towards vessel, 1mm movements at a time directed towards vessel. Move ultrasound probe forward off the needle tip, stabilising and then moving the needle further forward into the ultrasound's view.

Confirmation of cannulation

Visualisation of cannula and needle within the lumen of the vessel

- Transverse orientation – '*bull's eye sign'*
- Longitudinal orientation – needle seen entering and lying within lumen/vessel
- The needle only needs to be advanced a few millimetres along the centre of the vein before advancing the cannula off of the needle to avoid unnecessary transfixation.

Flashback of blood through cannula: the ultrasound probe can be put down at this point so that both hands can be used to advance the catheter. Then remove the needle, attach the needless connector, flush the cannula with normal saline (10ml), clean the surrounding skin and secure in place with a transparent dressing. If you are cannulating close to an artery (brachial vein) and have any doubts of accurate venous access, always check with a blood gas reading to confirm venous or arterial placement.

5.4 Challenges and limitations:

Complications

In comparison to blind techniques, complications associated with ultrasound guided peripheral intravenous cannulation are typically minor but include:
Nerve injury; Accidental puncture of a nerve which may cause injury.
Arterial cannulation; highlights importance of confirming venous characteristics on ultrasound prior to cannulation
Infiltration/extravasation if cannula becomes dislodged from deeper vein. Transfixation of the vein.

As with most ultrasound procedures, there is operator variability in skill sets. Additionally, like blind peripheral intravenous cannulation if there is insufficient or minimal catheter within the vessel lumen, it may dislodge with arm movements, resulting in loss of venous access and infiltration of infused solution. This risk can be reduced by using a longer cannula and advancing the entire length of the cannula under ultrasound guidance. One should make sure to properly clean all involved areas and maintain sterility throughout the procedure. While studies have demonstrated minimal infection risks with the use of ultrasound, the addition of the ultrasound machine provides a further potential source for infection if not properly cleaned or lack of compliance or understanding of aseptic non-touch technique (ANTT).

6. Special Considerations

Ultrasound imaging has been used for over 20 years and has an excellent safety record. It is based on non-ionizing radiation, so it does not have the same risks as X-rays or other types of imaging systems that use ionizing radiation. Although ultrasound imaging is generally considered safe when used prudently by appropriately trained health care providers, ultrasound energy has the potential to produce biological effects on the body. Ultrasound waves can heat the tissues slightly. In some cases, it can also produce small pockets of gas in body fluids or tissues (cavitation). The long-term consequences of these effects are still unknown

The UK Health Security Agency (UKHSA) provides clear infection prevention guidance on the appropriate use of ultrasound gel in various clinical settings to minimise the risk of infection (Appendix B). Sterile ultrasound gel is mandated for any invasive procedure including cannulation.

Ultrasound Probe Selection:
A high resolution with a linear array is preferred for Ultrasound Cannulation; a linear array probe is more likely to deliver an accurate visualisation of the anatomical structures near the surface of the skin. It is important to note that higher frequency probes for Ultrasound provide better visualisation for superficial venous structures, whereas a lower frequency probe is more suited for deeper vessels (Mahler SA et al (2011), American Institute of Ultrasound in Medicine. Use of ultrasound to guide vascular access procedures (2017)).

Ultrasound Orientation:
Ultrasound works by soundwaves. These soundwaves are sent out from the probe and contact the surface of objects within the human body. Once the soundwave has contacted an object a reflection is made causing the soundwave to return or 'bounce' back to the probe. The probe then creates electrical signals and calculations that produce an image on a screen. Vessels are anechoic (dark structures, usually circles); the needle and cannula are hyperechoic (causing a bright 'pinpoint'). The Gain setting on the Ultrasound will allow the operator to adjust the grey scale to their visualisation preference so clarity between anechoic and hyperechoic structures can be maximised. Additionally, the Ultrasound screen displays central markers going from top to bottom measured in centimetres. The user will be able to evaluate appropriate venous depth prior to cannulation.

Ultrasound Imaging Approaches:
The two main common practices and approaches of Ultrasound guided cannulation are Transverse (Short Axis) and Longitudinal (long Axis). An increase in successful cannulation has been found using the Short Axis technique compared to long axis methods **(**Gottlieb et. al. (2017)). However, either technique requires a steady hand as even slight movements can alter the appearance or visualisation of targeted vessels. Successful technique requires micro-movements of the Ultrasound probe.

Once the vein has been accessed (the hyperechoic needle is seen inside the anechoic vessel) a fanning - '**Stick and Stop' technique or 'chase the bevel' -** can be applied to aid successful cannulation via a Transverse (short Axis) approach. This technique allows the user to continually observe the direction and depth of the vein as well as the tip of the needle (Adhikari S, et al (2010), White A, et al (2010)). This method involves repeatedly advancing the probe by small increments and stopping. Then advancing the needle/cannula until the hyperechoic tip is visualised again inside the vein and again stopping the advance. Following the vein proximally, continue this technique until the hub of the cannula meets the patient's skin. This technique however does require practice and careful movements of the probe for consistent observation of the needle tip inside the vein.

Targeted Venous Anatomy for Ultrasound cannulation:
Ultrasound guided cannulation has been linked to poor durability depending on the vein/vessel chosen. Ultrasound cannulation of deep and proximal veins is associated with reduced survival and patency (Fields, J.M. et. al. (2012)). Therefore, targeting more shallow and distal veins for ultrasound guidance intravenous cannulation may be advantageous for device longevity. Ideally target the forearm Cephalic and Basilic veins, antebrachial vein and median cubital vein. An article by Witting et. al. (2010), demonstrated higher success rates with picking a vein of a diameter of at least 0.4 cm and a depth no greater than 1.5 cm.

Beware of nerves. Nerves will be visualised via ultrasound as light and white and clustered (sometimes honeycomb structured) and must be avoided. Some veins may not collapse when pressed with the probe, this could be due to calcification or possible thrombus – Cannulation of these veins should be avoided.

Cannula Length:
Shorter cannulas are quicker to insert, however may not have sufficient length inside the chosen vein (Gottlieb et al (2017)). This can lead to dislodgement from the vessel and cause damage to the surrounding tissues if the cannula was used (high risk of extravasation/infiltration). Therefore, using a longer cannula for deeper veins will permit a greater length inside the vessel and be less likely to dislodge. Consequently, it is of paramount importance to check the depth of the chosen vein *prior* to choosing the length of cannula for the procedure. The depth of the vein can be measured with the Ultrasound.

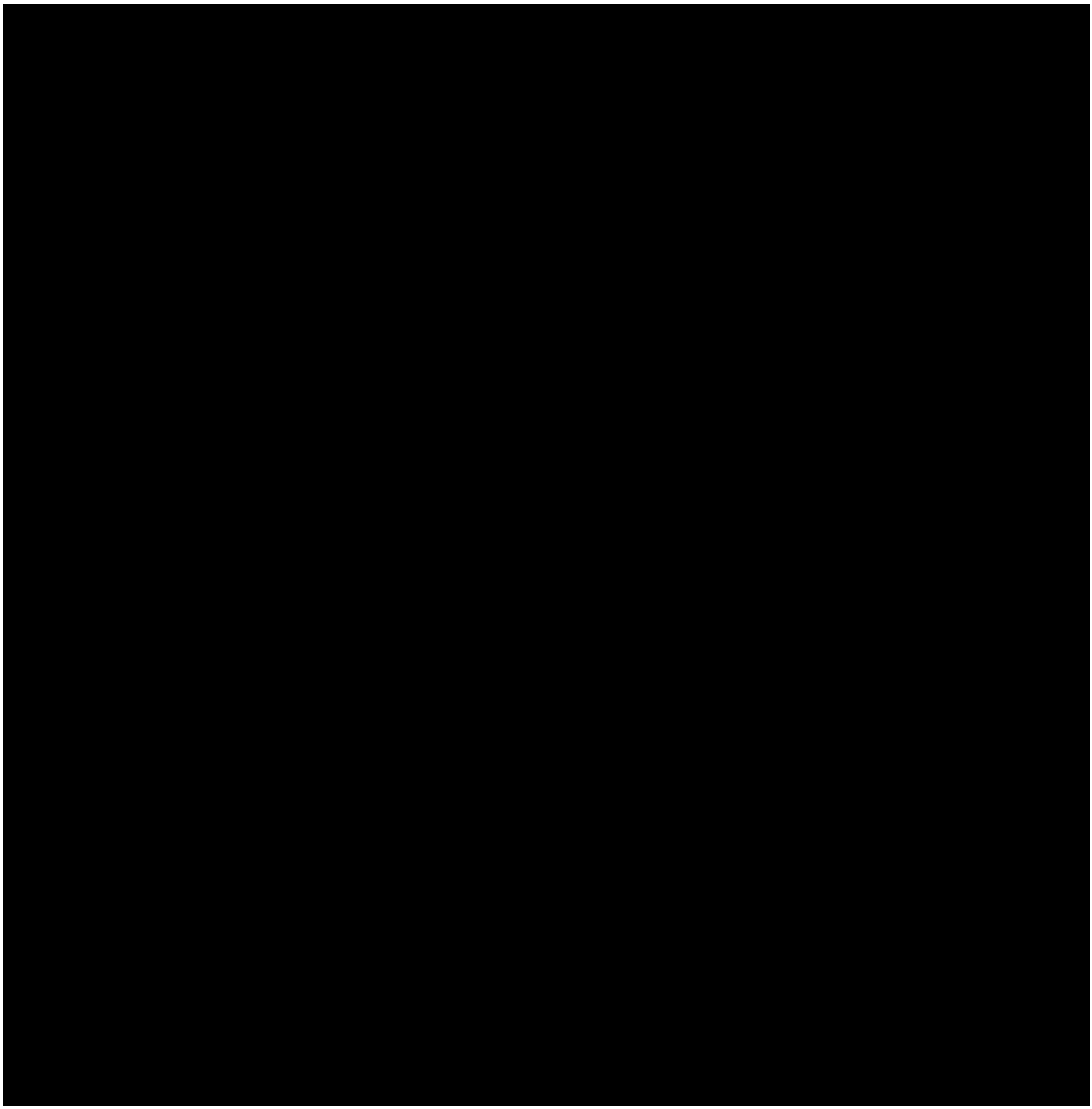
Angle for cannula insertion:
Angle for cannula insertion - the angle needed will vary on the device selected. For superficial veins a smaller cannula (22-24 gauges) placed at 10–25-degree angle. Accordingly, deeper veins will require a larger cannula (above gauge 24) placed at an angle of 30-45 degrees.
Aim to use Deep Access Cannulas – these are specifically designed for cannulation under the use of ultrasound. These cannulas will easily reach deep veins due to being 64mm in length. The extra length will counteract the cannula dislodging from the vein.

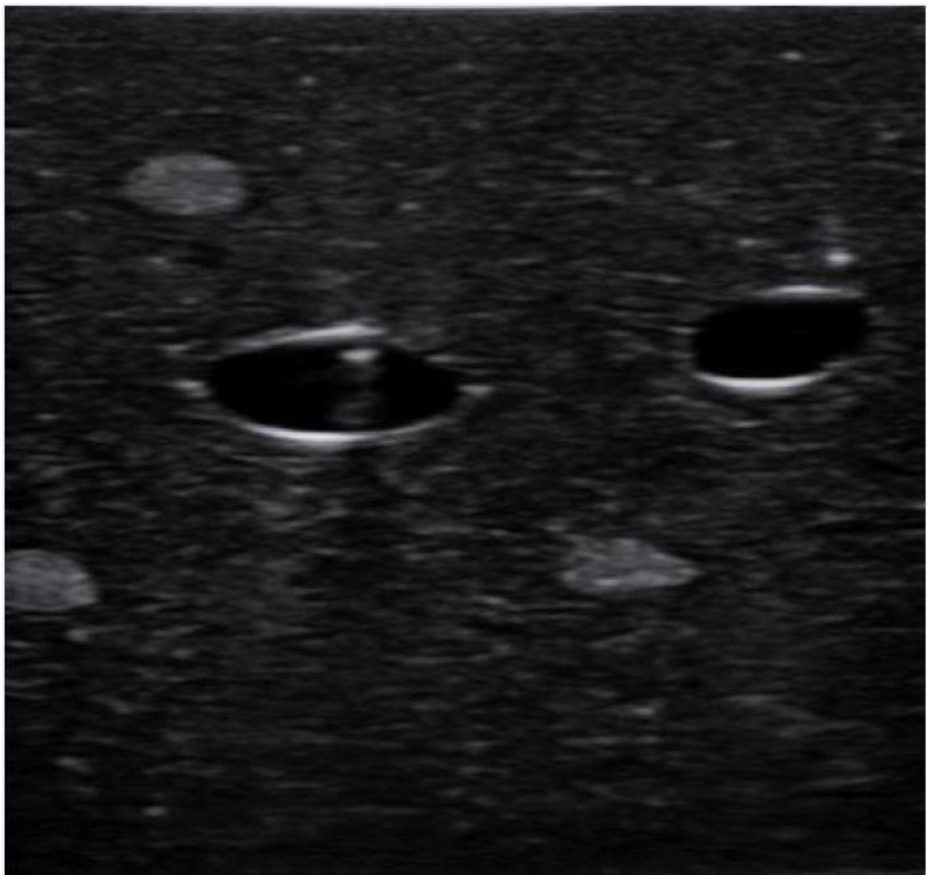
The ESHT Vascular Access Team advocates for and utilizes B. Braun Introcan Deep Access 22g,20g and 18g devices (64mm) which must be used with a CT rated extension needle free connecter, and the longer integrated Nexiva (45mm) cannulas in gauges 18-22 with ultrasound guidance. These cannulas are specifically designed for ultrasound-assisted insertion, featuring echogenic needle tips that enhance visibility and precise positioning. Introcan Deep Access cannulas are safe for extended use, with a dwell time of up to 28 days, provided there are no signs of infection (phlebitis), the line remains patent, and vascular access remains clinically indicated. In contrast, Nexiva cannulas have a maximum dwell time of 7 days under the same conditions.

With the implementation of [redacted] at ESHT, both cannula types can now be recorded within the electronic system. Cannula selection should always be guided by patient-specific needs and vein characteristics assessed via ultrasound.

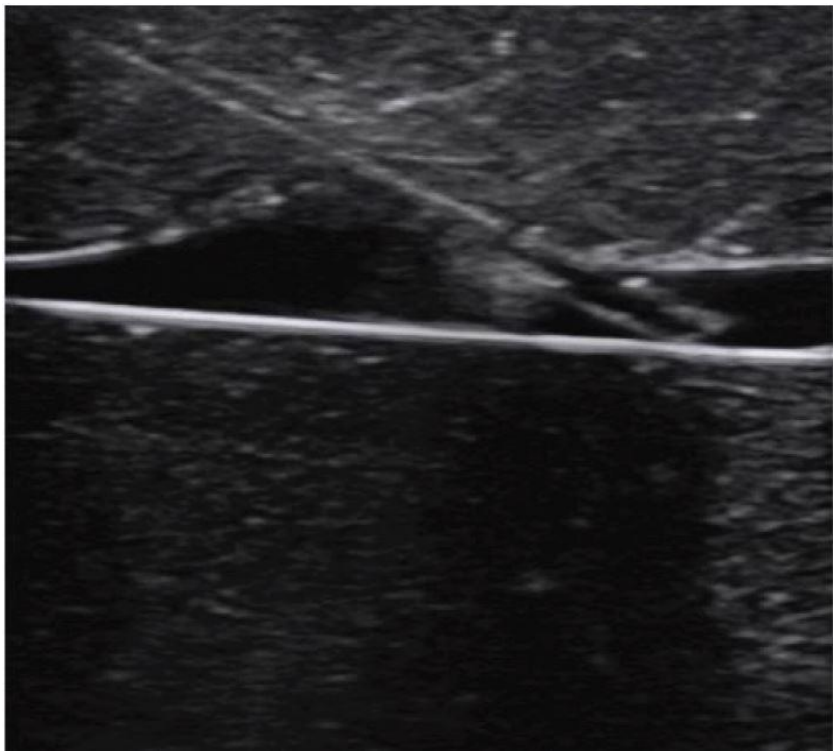
While the Introcan Safety® cannula remains the preferred choice for ultrasound-guided peripheral intravenous access in both the upper arm and antebrachial, the longer Nexiva® cannulas may be considered when clinically appropriate but ***only for the antebrachial arm***. The 18g and 16g ported style cannula such as the BD Venflon safety pro are 45mm in length and can be used, however vein ratio and blood flow need to be considered, in addition to the ported devices increasing infection rates as the ported caps do not have a membrane to clean and are sometimes mistakenly used, noting that any ported device has a maximum indwell time of 72hrs.

[redacted] **documentation for Ultrasound cannulation.**





Ultrasound image of needle shaft in short axis (transverse) on a phantom model.



Ultrasound image of peripheral intravenous line in long-axis (longitudinal) orientation on a phantom model.

7. Competencies and Training Requirements

Practitioners will need to master peripheral IV catheter insertion skills before advancing to ultrasound cannulation as the second tier of expertise, which also requires practitioners to be able to assess the need for ultrasound, when it is and when it is not appropriate.

To ensure safe and effective ultrasound-guided peripheral intravenous cannulation, all Healthcare Practitioners (HPCs) performing this procedure must demonstrate competency through structured training and supervised practice. Practitioners must complete a minimum of ten supervised insertions before being deemed competent to practice independently, as the techniques and hand-eye coordination differ significantly. An average of 25 patient encounters is required to achieve 10 successful ultrasound-guided peripheral IV catheter cannulations (Ault MJet al (2015)).

A supervisor must be an experienced practitioner already competent in Ultrasound cannulation using aseptic non-touch technique. The Supervisor must be confident that correct techniques are used, and aseptic techniques are maintained throughout the procedure. Practitioners must demonstrate proficiency in both theoretical knowledge and practical application, including ultrasound probe handling, vein identification, and real-time needle guidance. An Ultrasound Guided Cannulation Competency document must be signed by both parties and agreed to before a practitioner works independently.

To ensure continued competency, practitioners should maintain a record of their ultrasound-guided cannulation procedures as part of their Continuing Professional Development (CPD) portfolio. Regular competency reviews should be conducted to reinforce adherence to best practices and ensure compliance with trust policy.

8. Evidence Base/References

Adhikari S, Blaivas M, Morrison D, Lander L. Comparison of infection rates among ultrasound-guided versus traditionally placed peripheral intravenous lines. *J Ultrasound Med.* 2010;29(5):741-747.

Ault MJ, Tanabe R, Rosen BT. Peripheral intravenous access using ultrasound guidance: defining the learning curve. *J Assoc Vasc Access.* 2015; 20(1):32-36.

American Institute of Ultrasound in Medicine. Use of ultrasound to guide vascular access procedures. AIUM Resources. Accessed November 27, 2017. http://www.aium.org/resources/guidelines/usgva.pdf

fda.gov/medical imaging/ucm

Fields JM, Dean AJ, Todman RW, et al. The effect of vessel depth, diameter, and location on ultrasound-guided peripheral intravenous catheter longevity. Am J Emerg Med. 2012;30:(7)1134-40. [pubmed]

Gottlieb M, Sundaram T, Holladay D, Nakitende D. Ultrasound-guided peripheral intravenous line placement: a narrative review of evidencebased best practices. *West J Emerg Med.* 2017;18(6):1047-1054.

NICE Guidance on the use of ultrasound locating devices for placing central venous catheters. Technology appraisal guidance [TA49] Published date: 04 October 2002

Mahler SA, Wang H, Lester C, Skinner J, Arnold TC, Conrad SA. Shortvs long-axis approach to ultrasound-guided peripheral intravenous

access: a prospective randomized study. *Am J Emerg Med.* 2011;29(9): 1194-1197.

McCarthy, M.L., Shokoohi, H., Boniface, K.S., Eggelton, R., Lowey, A., Lim, K., Shesser, R., Li, X. and Zeger, S.L (2015) Ultrasonography Versus Landmark for Peripheral Intravenous Cannulation: A Randomized Controlled Trial. Annals of Emergency Medicine. October 13th. .

Safe vascular access 2016 Association of Anaesthetists of Great Britain and Ireland (AAGBI)

Sonosite ultrasound user guide with cleaning protocols.

Standard-length catheters vs long catheters in ultrasound-guided peripheral vein cannulation Fabrizio Elia MDa⁎, Giovanni Ferrari MDa, Paola Molino MDa, Marcella Converso MDa, Giovanna De Filippi MDa, Alberto Milan MDb, Franco Aprà MDa.

Ultrasound-Guided Peripheral Intravenous Line Placement: A Narrative Review of Evidence-based Best Practices
Michael Gottlieb, MD, RDMS, Tina Sundaram, MD, MS, Dallas Holladay, DO, and Damali Nakitende, MD, RDMS West J Emerg Med. 2017 Oct; 18(6): 1047–1054.
Published online 2017 Sep 11. doi: 10.5811/westjem.2017.7.34610

van Loon, F.H.J., Buise, M.P., Claassen, J.J.F., Dierick-van Daele, A.T.M. and Bouwman, A.R.A. (2018) Comparison of ultrasound guidance with palpation and direct visualisation for peripheral vein cannulation in adult patients: a systematic review and meta-analysis. British Journal of Anaesthesia. 121(2), p.358-366.

White A, Lopez F, Stone P. Developing and sustaining an ultrasoundguided peripheral intravenous access program for emergency nurses. *Adv Emerg Nurs J.* 2010;32(2):173-188.

Witting MD, Schenkel SM, Lawner BJ, Euerle BD. Effects of vein width and depth on ultrasound-guided peripheral intravenous success rates. *J Emerg Med*. 2010 Jul. 39(1):70-5. [Medline].

Links and websites

www.electrotherapy.org	www.ivaccess.com
www.sonosite.com	www.youtube.com
www.fda.gov	www.aagbi.org

https://nivas.org.uk/videos/uk-vessel-health-and-preservation-video download for Vessel Health preservation poster.

https://www.youtube.com/watch?v=IREUPXCpK8Y (ultrasound guided peripheral IV access)

https://emedicine.medscape.com/article/1998177-overview

https://www.bbraun.com/en/products/b1/introcan-safety-deepaccess.html

https://khub.net/documents/135939561/554202359/Decision+tree+–+IPC+guide+on+how+to+use+ultrasound+gel.pdf/83543594-993e-3150-3e7a-5467ce62babd?t=1636462765735

9. Document Monitoring Table

Element to be Monitored	Lead	Tool for Monitoring	Frequency	Responsible Individual/Group/ Committee for review of results/report	Responsible individual/ group/ committee for acting on recommendations/action plan	Responsible individual/group/ committee for ensuring action plan/lessons learnt are Implemented
Compliance in obtaining Ultrasound cannulation	VAT Lead	One to one observation, competency document completion		Vascular Access Team/ Core Services Quality and Governance Group	Vascular Access Team	Vascular Access Team
Needle stick injury.	VAT Lead	[redacted] reports	On occurrence	Occupational Health Team	Core Services Quality & Governance Group	Vascular Access Team
Adhering to best practice	VAT Lead	Audit	Annually	Vascular Access team/Core Services Quality & Governance Group	Core Services Quality & Governance Group	Vascular Access Team

10. Equality and Health Inequalities Impact Statement

The Vascular Access Team teach and practice on the principle of excellent clinical assessment, therefore practice is based on individual clinical need. However, an Equality Impact Assessment has been completed and can be found in Appendix A.

Appendix A: Equality and Health Inequalities Impact Assessment

SECTION A ADMINISTRATIVE INFORMATION

This form is a central part of how the Trust makes sure and can demonstrate to others that we are meeting our legal duties; and how we can assure ourselves that all patients will get the best outcome for them from our services.

. **Function/policy/service name and number:**	Guidelines for Ultrasound Peripheral Venous Cannulation V3.0 (Document ID: 1731)		
Main aims and intended outcomes of the function/policy/service and summary of the changes you are making (if existing policy/service):	The policy aims to ensure safe, consistent and competent US guided cannulation practices by clinical staff at ESHT. It outlines training requirements, procedural steps, and competency assessments to safeguard patients and reduce risks. This version updates evidence-based practice.		
How will the function/policy/service change be put into practice?	By providing mandatory training and competency assessments for staff Regular updates to align with current standards and practices Routine monitoring of compliance through incident reports and audit		
Who will be affected/benefit from the policy?	Clinical staff undertaking ultrasound guided venous cannulation Patients requiring venous access for therapeutic purposes who are difficult to cannulate.		
State type of policy/service	Policy ☐ **X**	Service ☐ **X**	
	Business Case ☐	Function ☐	Existing **X**
Is an EHIA required? NB :Most policies/functions will require an EA with few exceptions such as routine procedures	Yes ☐ **X**		
	No ☐ (If no state reasons)		
Accountable Director: (Job Title)	CHIEF MEDICAL OFFICER		
Assessment Carried out by:	[redacted]		
Contact Details:	[redacted]		
Date Completed:	5th June 2025		

SECTION B ANALYSIS AND EVIDENCE

Analysis of the potential impact – Equality and Health Inequalities Duties

3. PROTECTED CHARACTERISTICS - Main potential positive or negative impact of the proposal for protected characteristic groups

Protected characteristic groups	Summary explanation of the *potential* positive or adverse impact of your proposal	How do you know this? (include here a brief explanation of what information you have used to identify potential adverse impact e.g. NICE guidance, local data, evidence reviews, stakeholder or patient feedback	Action that will be taken to address the potential for negative impact.
Age: older people; middle years; early years; children and young people.	These guidelines are primarily for adults; children are looked after by specialist teams. Elderly patients may be more likely to require this technique due to vein fragility or size	Staff and patient feedback	Individual patient assessment as per the Guideline.
Disability: physical, sensory and learning impairment; mental health condition; long-term conditions.	Patients with disabilities may face barriers in communication or positioning during procedures	NICE guidance and patient feedback	Provide accessible communication methods and ensure appropriate support for positioning
Gender Reassignment and/or people who identify as Transgender	No impact identified	Policy uniformly applies to all genders	N/A
Marriage & Civil Partnership: people married or in a civil partnership.	No impact identified	Policy uniformly applies	N/A
Pregnancy and Maternity: before and after childbirth and	Pregnant patients may face unique risks due to vascular changes	Local clinical feedback and staff observations	Include specific considerations in training for cannulation during pregnancy

Protected characteristic groups	Summary explanation of the *potential* positive or adverse impact of your proposal	How do you know this? (include here a brief explanation of what information you have used to identify potential adverse impact e.g. NICE guidance, local data, evidence reviews, stakeholder or patient feedback	Action that will be taken to address the potential for negative impact.
who are breastfeeding.			
Race:	Language barriers may impact communication and consent for non-native English speakers.	Patient complaints and Healthwatch feedback	Use interpreters and translated materials to facilitate communication
Religion and belief: people with different religions/faiths or beliefs, or none.	No specific impact identified	Policy uniformly applies	N/A
Sex:	No specific impact identified	Policy uniformly applies	N/A
Sexual orientation	No specific impact identified	Policy uniformly applies	N/A
Veterans/Armed Forces Communities	Veterans may present with vascular challenges due to prior injuries or medical conditions	Feedback from Armed Forces Covenant Duty considerations	This guideline can benefit people with difficult venous access

4. HEALTH INEQUALITIES -Potential positive or adverse impact for people who experience health inequalities summarised

Groups who face health inequalities[1]	Summary explanation of the potential positive or adverse impact of your proposal	How do you know this? (include here a brief explanation of what information you have used to identify potential adverse impact e.g. NICE guidance, local data, evidence reviews, stakeholder or patient feedback	Action that will be taken to address the potential for negative impact.
This includes all groups of people who may have poorer access to or outcomes from healthcare services. It includes: People who have experienced the care system; carers; homeless people; people involved in the criminal justice system; people who experience substance misuse or addiction; people who experience income or other deprivation; people with poor health literacy; people living in rural areas with limited access to services; refugees or asylum seekers; people in or who have been in the armed force; other groups who you identify as potentially having poorer access and outcomes.	*See below*		

Breakdown of Groups who are more likely to experience health inequalities:

Groups who face health inequalities[2]	Summary explanation of the potential positive or adverse impact of your proposal	How do you know this? (include here a brief explanation of what information you have used to identify potential adverse impact e.g. NICE guidance, local data, evidence reviews, stakeholder or patient feedback	Action that will be taken to address the potential for negative impact.
Carers of patients	Carers may require guidance on the cannulation process to support patients and reduce anxiety	Patient and carer surveys	Provide information to explain procedures, and give reassurance
Homeless people. People on the street; staying temporarily with friends /family; in hostels or B&Bs.	No impact identified from these guidelines. Inequalities in access to services are of separate consideration		
People involved in the criminal justice system: offenders in prison/on probation, ex-offenders.	No impact identified from these guidelines.		
People with addictions and/or substance misuse issues	Risk of damaged veins or reduced compliance	Clinical feedback and NICE guidelines	Provide specialised training for staff to address these challenges. This guideline can benefit people with difficult venous access.
People with poor literacy or health Literacy: (e.g. poor understanding of health services poor language skills).	Difficulty understanding procedure details or consent process	Data on local health literacy levels	Simplify patient-facing materials with visual aids and plain language
People living in deprived areas	No impact identified from these guidelines.		
Refugees, asylum seekers or those experiencing modern slavery	Language barriers and unfamiliarity with healthcare systems	Local refugee group feedback	Provide multilingual materials and access to interpreters Individual assessment of needs

Groups who face health inequalities[2]	Summary explanation of the potential positive or adverse impact of your proposal	How do you know this? (include here a brief explanation of what information you have used to identify potential adverse impact e.g. NICE guidance, local data, evidence reviews, stakeholder or patient feedback	Action that will be taken to address the potential for negative impact.
People who have served in the Armed Forces	See section 3		

SECTION C ENGAGEMENT

5. Engagement and consultation

a. Talking to patients, families and local communities can be a rich source of information to inform health care services. If you are making substantial changes it's likely that you'll have to undertake specific engagement with patients. For smaller changes and policies your may have undertaken some engagement with patient groups, gained insight from routine sources e.g. patient surveys, PALS or Complaints information or information from Healthwatch, you may also have looked at relevant engagement that others have undertaken in the Trust, or locally
Have any engagement or consultative activities been undertaken that considered how to address equalities issues or reduce health inequalities? Please place an x in the appropriate box below.

Yes	**No X**

b. If yes, please ensure all stakeholders are listed in the consultation table at the beginning of the policy.

SECTION D SUMMARY OF FINDINGS

Reflecting on all of the information included in your review-

6. EQUALITY DUTIES: Is your assessment that your proposal will support compliance with the Public Sector Equality Duty? Please **add an x** to the relevant box below.

	Tackling discrimination	Advancing equality of opportunity	Fostering good relations
The proposal will support?	X	X	X
The proposal may support?			
Uncertain whether the proposal will support?			

7. HEALTH INEQUALITIES: Is your assessment that your proposal will support reducing health inequalities faced by patients? Please add an x to the relevant box below.

	Reducing inequalities in access to health care	Reducing inequalities in health outcomes
The proposal will support?	X	X
The proposal may support?		
Uncertain if the proposal will support?		

8. Outstanding key issues/questions that may require further consultation, research or additional evidence. Please list your top 3 in order of priority or state N/A

Key issue or question to be answered		Type of consultation, research or other evidence that would address the issue and/or answer the question
1	Communication for safety	Evaluation of interpreter service availability during cannulation
2	Outcomes for high risk groups	Monitoring outcomes for high-risk groups, such as substance misuse patients
3		

9. EHIA sign-off: (this section must be signed)

Person completing the EHIA:	[redacted]	**Date: 05/06/25**
Line Manager of person completing:	**Dee Daly**	**Date: 05/06/25**

Appendix A – EHIA Resources
Sources of Information on the East Sussex population and sources of community or patient insight.

Population Data
State of the County 2021 Focus on East Sussex

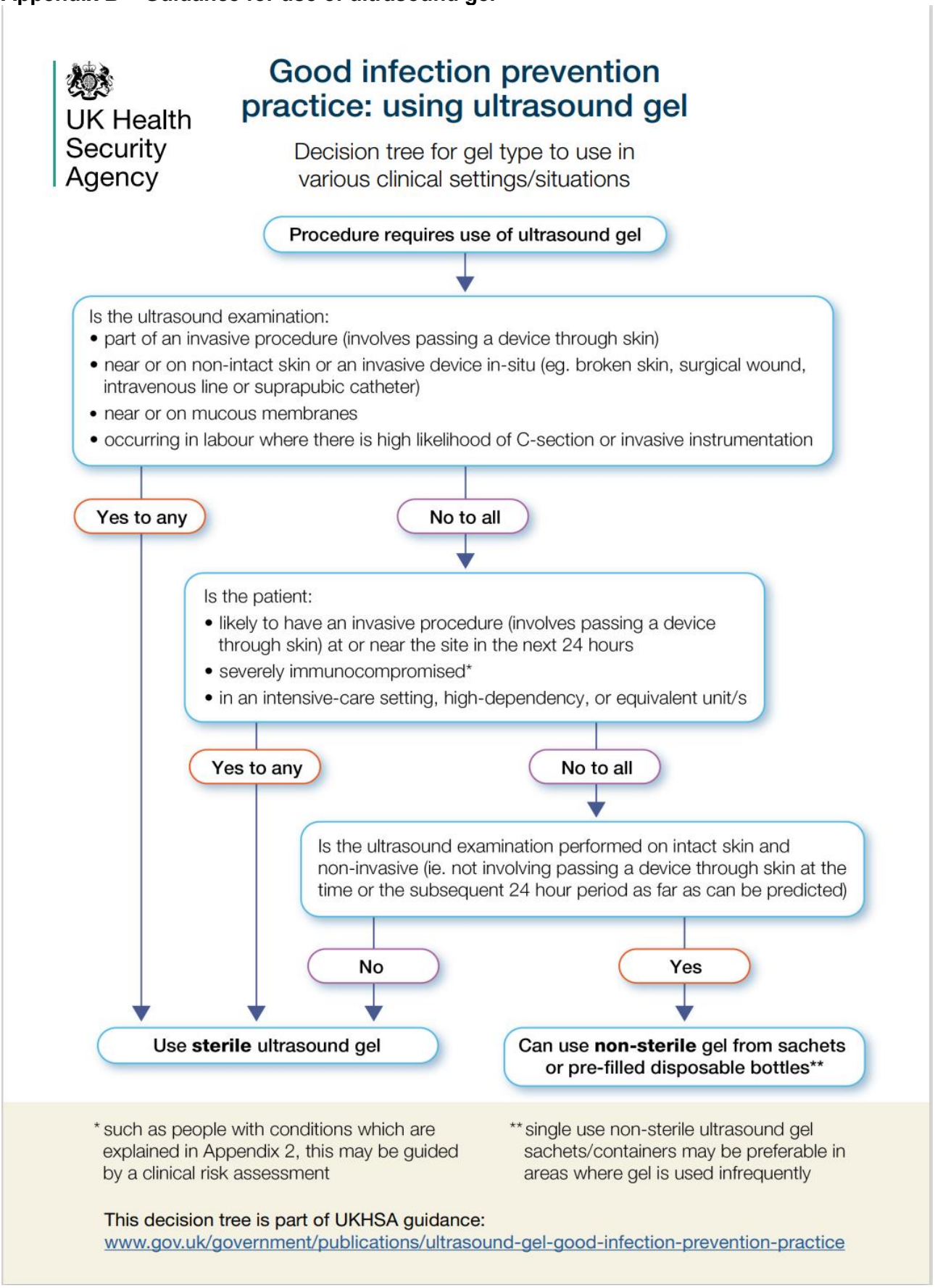
East Sussex JSNA

Community Insight

Further Reading on Equality and Health Inequalities

Training

Appendix B – Guidance for use of ultrasound gel



Appendix C – Competency Document

Ultrasound Guided Cannulation Competency Document.

Minimum of 10 supervised successful cannula insertions - The supervisor must be happy with your competency before solo working. Skills must be met within strict compliance of EHST Trust policy.

Please keep this evidence for your CPD folder and next appraisal.

I have completed a minimum of 10 supervised Ultrasound guided cannulations in accordance with ESHT Trust policy and now feel confident and competent to perform this skill without direct supervision. I understand the associated risks and benefits when using Ultrasound guided cannulation.
Signature of Supervisee _____

I have witnessed a minimum of 10 supervised Ultrasound guided cannulations in accordance with EHST Trust policy. I am confident that the criteria needed for Ultrasound guided cannulation has been met and is at a standard suitable for practice.
Signature of Supervisor_____

Date	**Clinical Area**	**Procedure Details** (sterile technique, cannula gauge)	**Supervisor/Mentor Signature**	**Comments**

Ultrasound-guided cannulation should prioritise selecting the right vascular access device for the right treatment at the right time, minimising the number of insertions. The use of ultrasound enhances vein visualisation, reducing the risk of multiple attempts and associated complications. The selection of an appropriate vascular access device should be guided by treatment duration, vessel health, and the patient's specific clinical needs. The risk of extravasation can be reduced by ensuring the most suitable device is chosen based on the intravenous treatment profile. Decision-making tools, such as the Vessel Health and Preservation (VHP) framework, support evidence-based assessment and

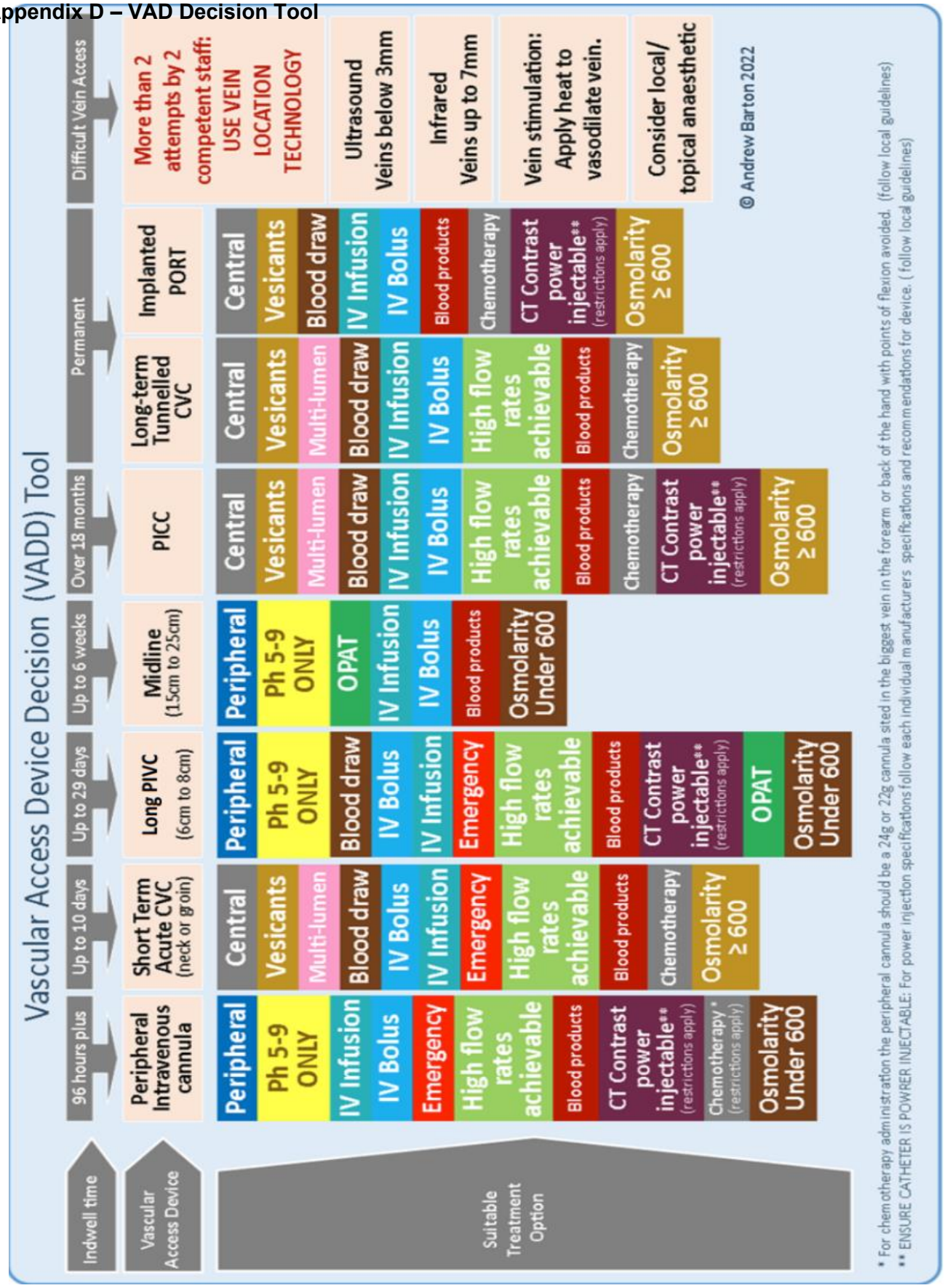
selection. If more than two attempts by competent staff are unsuccessful, vein location technology, including ultrasound, should be used to optimise success. Consideration should also be given to local anaesthetic use, vein stimulation techniques, and appropriate catheter specifications to enhance patient comfort and procedural efficacy.

Nivas (National Infusion and Vascular Access Society) provide more information and guidance. Also, be familiar with Vessel Health Preservation guidelines to support clinical decision making.
Nivas | Links & Guidance

Ultrasound-guided cannulation should also prioritise early identification and prevention of infiltration or extravasation to minimise patient harm. If a vascular access device has been in situ within the affected limb in the past two weeks and was used for vesicant therapy, clinicians should assess for signs such as pain, swelling, erythema, non-blanching skin, blisters, or necrosis. If the limb appears swollen, cold, and exhibits poor or absent capillary refill, extravasation or compartment syndrome should be suspected, necessitating immediate intervention. The infusion must be stopped, the device left in situ, and aspiration attempted while reassuring the patient and managing pain. Identification of the vesicant involved is crucial to determine appropriate antidote administration. In cases where an antidote is unavailable, referral for washout treatment or removal of the device should be considered. Severe extravasation injuries should be documented, including medical photography, and escalated to plastics for specialist review. Where applicable, systemic anti-cancer therapy (SACT) extravasations should follow local Trust policy and guidance. Incident reporting should be completed, and follow-up arranged to ensure ongoing monitoring and patient safety.

Practitioners must be aware of the infusate that is going to be administered to the patient. Some infusates are not suitable for peripheral IV administration – practitioners should know the Ph and osmolarity of the IV treatment, and whether the infusate in a known vesicant. ESHT NHS Trust has access to EOLAS Medical – Antimicrobial prescribing guidelines for this information.
Antimicrobial prescribing guidelines and policy - tasks and guides

Appendix D – VAD Decision Tool



Appendix E – Intracan Operation notes and observation charts

The following pages are paper form operation notes and device observation charts to be used when and if [redacted] fails to be operational.

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Appendix C: Introcan Deep Access Cannula Documentation PVAD

East Sussex Healthcare NHS Trust

INTROCAN Deep Access Cannula Documentation
Peripheral vascular Device

Ward:

Site:						Date /Time inserted: / / : hrs.			
Gauge / type: 18g 20G 22G						Inserted by:			
Mls per second		CT Rated Yes							
Insertion The following is MANDATORY - Initial each action as your record									
Wash hands		Gloves worn		Apron worn		Dressing Pack used			
Chloraprep skin prep. – clean area for 30 seconds and allow to dry for 30 seconds. *Use Iodine if sensitive to Chlorhexidine*									
Lumens flushed before and after insertion				Transparent semi-permeable dressing applied					
		Is the cannula safe to be used -							
Comments:						Signature			

Day 0 date / /			Day 1 date / /			Day 2 date / /			Day 3 date / /		
Checks	Day	Night	Checks	Day	Night	Checks	Day	Night	Checks	Day	Night
Site Assessed			Site Assessed			Site Assessed			Site Assessed		
Dressing Intact			Dressing Intact			Dressing Intact			Dressing Intact		
Line Secure			Line Secure			Line Secure			Line Secure		
Patient Apyrexial			Patient Apyrexial			Patient Apyrexial			Patient Apyrexial		
Comments			Comments			Comments			Comments		

Day 4 date / /			Day 5 date / /			Day 6 date / /			Day 7 date / /		
Checks	Day	Night	Checks	Day	Night	Checks	Day	Night	Checks	Day	Night
Site Assessed			Site Assessed			Site Assessed			Site Assessed		
Dressing Intact			Dressing Intact			Dressing Intact			Dressing Intact		
Line Secure			Line Secure			Line Secure			Line Secure		
Patient Apyrexial			Patient Apyrexial			Patient Apyrexial			Patient Apyrexial		
Comments.			Comments			Comments			Comments		

Day 8 date / /			Day 9 date / /			Day 10 date / /			Day 11 date / /		
Checks	Day	Night	Checks	Day	Night	Checks	Day	Night	Checks	Day	Night
Site Assessed			Site Assessed			Site Assessed			Site Assessed		
Dressing Intact			Dressing Intact			Dressing Intact			Dressing Intact		
Line Secure			Line Secure			Line Secure			Line Secure		
Patient Apyrexial			Patient Apyrexial			Patient Apyrexial			Patient Apyrexial		
Comments			Comments			Comments			Comments		

Day 12 date / /			Day 13 date / /			Day 14 date / /			Day 15 date / /		
Checks	Day	Night	Checks	Day	Night	Checks	Day	Night	Checks	Day	Night
Site Assessed			Site Assessed			Site Assessed			Site Assessed		
Dressing Intact			Dressing Intact			Dressing Intact			Dressing Intact		
Line Secure			Line Secure			Line Secure			Line Secure		
Patient Apyrexial			Patient Apyrexial			Patient Apyrexial			Patient Apyrexial		
Comments			Comments			Comments			Comments		

Insertion site is satisfactory if it is clean, dry and no signs of inflammation, infection, phlebitis or clots.

INFORM VAT IF:
- **Insertion site red, inflamed or showing signs of infection, vein engorgement (above insertion site), pain or swelling**
- **Patient is pyrexial (37.4 to 38.4 core temp.) If temp > 38.4 consider taking blood cultures.**
- **Line won't flush or appears blocked.**

Day 16_ date / /		
Checks	Day	Night
Site Assessed		
Dressing Intact		
Line Secure		
Patient Apyrexial		
Comments		

Day 17_ date / /		
Checks	Day	Night
Site Assessed		
Dressing Intact		
Line Secure		
Patient Apyrexial		
Comments		

Day 18_ date / /		
Checks	Day	Night
Site Assessed		
Dressing Intact		
Line Secure		
Patient Apyrexial		
Comments		

Day _19_ date / /		
Checks	Day	Night
Site Assessed		
Dressing Intact		
Line Secure		
Patient Apyrexial		
Comments		

Day 20_ date / /		
Checks	Day	Night
Site Assessed		
Dressing Intact		
Line Secure		
Patient Apyrexial		
Comments.		

Day 21_ date / /		
Checks	Day	Night
Site Assessed		
Dressing Intact		
Line Secure		
Patient Apyrexial		
Comments		

Day 22_ date / /		
Checks	Day	Night
Site Assessed		
Dressing Intact		
Line Secure		
Patient Apyrexial		
Comments		

Day 23_ date / /		
Checks	Day	Night
Site Assessed		
Dressing Intact		
Line Secure		
Patient Apyrexial		
Comments		

Day 24_ date / /		
Checks	Day	Night
Site Assessed		
Dressing Intact		
Line Secure		
Patient Apyrexial		
Comments		

Day 25_ date / /		
Checks	Day	Night
Site Assessed		
Dressing Intact		
Line Secure		
Patient Apyrexial		
Comments		

Day 26 date / /		
Checks	Day	Night
Site Assessed		
Dressing Intact		
Line Secure		
Patient Apyrexial		
Comments		

Day 27 date / /		
Checks	Day	Night
Site Assessed		
Dressing Intact		
Line Secure		
Patient Apyrexial		
Comments		

Day 28 date / /		
Checks	Day	Night
Site Assessed		
Dressing Intact		
Line Secure		
Patient Apyrexial		
Comments		

Day 29_ date / /		
Checks	Day	Night
Site Assessed		
Dressing Intact		
Line Secure		
Patient Apyrexial		
Comments **Remove**		

The Introcan (Deep Access cannula) is an intravascular catheter inserted into a patient's peripheral vascular system for short term use (Less than 30 days). This cannula can be used to administer Intravenous (IV) Fluids and peripheral IV Medications. Medications with osmolarlity greater than 600mOsm/l and PH levels greater than 9 and lower than 5 should not be given via this cannula – a central line should be considered. Contact the Vascular Access Team for more information.

Gauges 22g-18g Catheters may be used with power injectors for which the maximum pressure setting is 300 psi/21 bar.

Flow rate of Introcan cannulas

22 Gauge (blue) - 7ml / second.
20 Gauge (Pink) – 13ml / second.
18 Gauge (green) – 19ml / second.

NEEDLELESS CONNECTORS:

- Use on all IV ports where routine access is required
- The connector MUST be swabbed with Chlorhexidine/alcohol swab and allowed to dry for 30 seconds.

BLOOD SAMPLING:

- Using aseptic technique – wash hands and wear gloves.
- Clean needleless connector with Chlorhexidine 2% / 70% Isopropyl alcohol swab and allowed to dry for 30 seconds.
- Using 10ml luer-lock syringe, withdraw approximately 5mls of blood and discard.
- Proceed to take the blood sample with a new 10ml luer-lock syringe and flush immediately with 10ml of normal saline.
- Use a blood transfer device to exchange the sample from syringe to a blood sample bottle(s).

INTRAVENOUS MEDICATION:

- Wash hands/wear gloves for all manipulations/administrations
- Clean lumen/needleless connector with Chlorhexidine/alcohol swab and allow to dry for 30 seconds.
- Administer IV medication as per Trust protocols. Medications with osmolarlity greater than 600mOsm/l and PH levels greater than 9 and lower than 5 should not be given via this cannula – a central line should be inserted. Contact the Vascular Access Team for more information.
- Do not re-use giving sets or caps once disconnected
- Flush with 0.9% saline after each IV medication

DRESSINGS:

- Change dressing if not intact, insertion site requires cleaning or after 7 days.
- Use aseptic technique.
- Clean site with Chlorhexidine 2% + 70% Isopropyl alcohol (ChloraPrep)
- Use transparent semi permeable IV dressing and change needleless connector(s) every 7 days or when necessary.

Flushing: The INTROCAN DEEP ACCESS CANNULA should be flushed with 10ml normal saline (0.9%).

- Once Daily when not in use and/or
- After each use
- Using aseptic technique

Please file in Anaesthetics

East Sussex Healthcare NHS
NHS Trust

PAS label here

INTROCAN (Deep Access Cannula) OPERATION NOTES

Date..... Operator..... Ward.....

Assistant..... Bedspace.....

Insertion:

Gauge: 24 ☐ 22 ☐ 20 ☐ 18 ☐

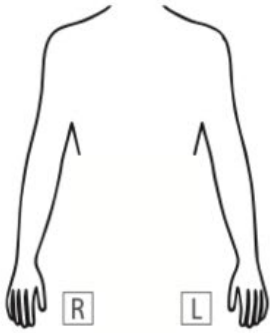
Consent: Informed ☐ Implied ☐ Unable ☐

Insertion using ultrasound: Yes ☐ No ☐

Reason for insertion: _____

Number of attempts: _____

Please mark successful cannulation with an X and faild cannualtion with an F.



- Vein chosen…Basilic / Brachial / Cephalic / Antebrachial / Radial
- NACL 0.9% flush throughout with no resistance.....Yes/No
- Dressing applied and dated…...Yes / No
- CT-rated extension in situ. Yes / No
- Arterial puncture on failed attempt? No / Yes (if yes, compression for 5 mins)
- Recorded on Nerve centre Yes / No
- Operation notes .....

The Introcan is a long peripheral cannula that can remain in situ for up to 28 days depending on VIP score and clinical indication. The device must be checked and maintained regularly as per policy, with electronic records being maintained on Nerve centre.

The Vascular Access Team are aware that although blood sampling can be obtained using an Introcan peripheral cannula, it is not reliable or guaranteed, with field-based research indicating that blood sampling may only be viable for a short period after insertion.

Handover of insertion of this device has been given to

Name Sign Date. Time.

THIS DEVICE IS NOT SUITABLE FOR VIRTUAL WARD FOR COMMUNITY USE
Multidisciplinary should consider Midline or PICC if the patient is to be discharged for IV therapy
Please see Overleaf for information regarding blood sampling.

Please file in Anaesthetics

Observation

- The Introcan should be observed and recorded as being observed on Nerve centre every time the device is accessed, used or observed, a minimum of 12 hourly. **(Suggestion check and record at the start of shift and on medication rounds)**

Dressings

- The Introcan dressing will need changing weekly or sooner if soiled or compromised, clinical areas will be responsible for informing the Vascular Access Team who will change the dressing.

Flushing

- An aseptic non-touch technique should be observed when handling the Introcan.
- A 2% chlorhexidine 70% Alcohol (Dark green) wipe should be used to 'scrub the hub' of the needleless connector for 30 seconds and be allowed to dry before accessing it.
- The Introcan should be flushed pre- and post-intravenous therapy with a minimum of 10mls 0.9% Saline (Pre-filled syringe) using a turbulent push-pause technique.
- If the line is not being used during the shift, the need for the device should be questioned and removed if not clinically indicated. The line should be flushed each shift with 10mls Saline if not being used that shift and recorded as part of the Nerve centre checks.

Blood sampling via Peripheral Intravenous Vascular Access Devices PVAD:

RCN Infusion standards (2018) state, peripheral cannulae should not be used routinely for blood sampling due to haemolysis of the sample, which may give false results (WHO, 2010). More recently, Jacob et al. (2021) and Davies et al. (2020) research suggests there was no significant difference in haemolysis rates associated with sampling blood from a PIVC compared with venepuncture.

Blood Sampling.

- Using an aseptic technique, clean the needleless connector with a dark green 2% Chlorhexidine/ 70% alcohol swab and allow it to dry.
- Using a 10ml syringe, withdraw approximately 1-3mls, using a pull pause technique and discard (unless taking blood cultures)
- Using a 10ml syringe, aspirate blood required for sampling using a pull pause technique allowing the vein to fill.
- The Introcan **MUST** be flushed immediately with 10-20mls of 0.9% saline (pre-filled saline syringe).
- Then transfer the blood sample collected in the syringe using a syringe transfer device into the blood bottles.
    - A vacuum collection system may be used cautiously (minimum of 5mls capacity) as the negative pressure may cause vein collapse or and cannula occlusion.
- The Introcan MUST be flushed with a minimum of 10mls 0.9% saline (pre-filled saline syringe) using a push pause technique immediately after unsuccessful and successful blood draw to prevent occlusion.
- If unable to obtain a blood sample, review the patient's Vessel Health state and accessible veins then obtain a sample using standard venepuncture, the presence of an introcan does not always indicate that a patient has Difficult Intravenous Vascular Access (DIVA). If after review and assessment and/or attempt if appropriate, refer back to the Vascular Access Team (VAT) for support.

Removal

When removal is indicated or if the Introcan fails and cannot be used for IV access as its primary function, the device can be removed like any other peripheral device/cannula using following aseptic non-touch technique, remove the dressing and securement device and applying sterile gauze as a pressure dressing and secure with appropriate adhesive dressing or tape and recorded on the nerve centre.

References:

Davies, H., Coventry, L. L., Jacob, A., Stoneman, L. & Jacob, E. (2020). Blood sampling through peripheral intravenous cannulas: A look at current practice in Australia. *Collegian,* **27**(2), 219-225.

Jacob, E., Jacob, A., Davies, H., Jacob, D., Jenkins, M., Husain, M. & Coventry, L. (2021). The impact of blood sampling technique, including the use of peripheral intravenous cannula, on haemolysis rates: A cohort study. *Journal of Clinical Nursing,* **30**(13-14), 1916-1926.

Standards for infusion therapy | Infection prevention and control | Royal College of Nursing (rcn.org.uk)

Appendix F: Poster – Are you using the right type of Chlorhexidine?

Are you using the right Types of Chlorhexidine Product for ANTT Cannulation, invasive procedure, IV medication administration or Blood Cultures?

NHS
East Sussex Healthcare
NHS Trust

BD Chloraprep 1ml Applicator, NHS supply chain code DMK000

Can be used for:

- Cannulation, Blood Cultures sampling, Bloods, injections, sub cut infusion/injection skin prep
- Note: PICC Dressings should use the 3mls applicator. NHS code: MRB306

Green 2% Chlorhexidine in 70% Alcohol devices wipes Product code: CA2C240 NHSSC: VJT638

- For needle free connector device cleaning (such as Bionector) NOT FOR CANNULATION
- Blood Culture Bottles tops, antibiotic or medication vial decontamination and others ANTT preparation

Blue Clinell 2% chlorhexidine skin wipes NHS Supply chain code VJT169

- For IM/SC injections
- For Routine Blood sampling NOT FOR CANNULATION

Clinell Alcoholic 2% Chlorhexidine Skin wipes are licensed for cleaning skin after dressing and plaster removal, especially where the dressing has caused dirt to develop.

Do not use non-sterile alcohol-free wipes for any Cannulation, Blood cultures, or decontamination before accessing or placing any Vascular Access.

Contact the Vascular Access Team via online referral for any further information or advice.

Created by Samantha Fowler VAT Support Practitioner 13/03/2023 update by Graham Howard Vascular Access Lead Nurse 06/02/2024 Updated 07/08/2025 Version 4

East Sussex Healthcare NHS Trust

Intravenous Iron Supplementation- Adult Prescribing and Administration Guidelines

Document ID Number:	2113
Version:	V2.1
Ratified by:	Medicines Optimisation Group
Date ratified:	6 March 2024
Name of author and title:	[redacted] Lead Transfusion Practitioner Kelly Mintrim, Service Manager Infusion Units [redacted], Trust Lead Nurse Iron Deficiency Treatment Pathway
Date originally written:	February 2020
Name of responsible committee/individual:	Medicines Optimisation Group
Date issued:	15 March 2024
Review date:	March 2027
Target audience:	ESHT Medical, Nursing and Pharmacy staff
Compliance with CQC Fundamental Standard	Safe care and treatment
Compliance with any other external requirements (e.g. Information Governance)	N/A
Associated Documents:	Policy for the Management and Administration of Injectable medicines Medicines Policy [Medicines Code] Prescribing Standards [Medicines Code]

Did you print this yourself?
Please be advised the Trust discourages retention of hard copies of the procedural document and can only guarantee that the procedural document on the Trust website is the most up to date version.

Version Control Table

Version number and issue number	Date	Author	Reason for Change	Description of Changes Made
V1.0	February 2020	Stephanie Collins	New Guideline	
V1.1	June 2021	Stephanie Collins	Update	Change to some wording in the Iron deficiency guidelines so it fits practice in the infusion units as well as inpatient wards
V2.0	January 2024	[redacted], Kelly Mintrim, [redacted]	Review due	Inclusion of Ferric carboxymaltose (Ferinject)
V2.1	March 2024		Updated for maternity	Additional guidance for pregnancy patients

Consultation Table

This document has been developed in consultation with the groups and/or individuals in this table:

Name of Individual or group	Title	Date
Jane Starr	MSO	November 2023
Dr Nigel Sargant	Consultant Haematologist	November 2023
[redacted]	Lead Transfusion Practitioner	November 2023
Kelly Mintrim	Infusion Unit Matron	November 2023
[redacted]	Lead IV Iron (IDA Pathway)	In Post February 2024
Medicines Optimisation Group		March 2024

This information may be made available in alternative languages and formats, such as large print, upon request. Please contact the document author to discuss.

Table of Contents

1. Introduction

Iron deficiency is normally treated satisfactorily by the use of oral iron supplements. Circumstances when parenteral iron is indicated to replace iron stores include:

- oral iron preparations are ineffective or cannot be used (e.g. intolerance in inflammatory bowel disease),
- where there is a clinical need for rapid iron delivery (e.g. perioperative anaemia, severe anaemia in late pregnancy or postpartum anaemia)
- support the use of erythropoiesis stimulating agents (including patients on renal dialysis).

This guidance applies to patients being treated in outpatient and inpatient settings. Ferric carboxymaltose (Ferinject®) and Ferric derisomaltose (former brand name Monofer®) are the intravenous iron preparations which offers the ability to administer the total iron requirements in one or two infusions. The ability to treat patients with their indicated iron load represents improved clinical treatment. As such the requirement for repeat infusions may be avoided or the interval between courses extended.

2. Rationale

To ensure that healthcare professionals at East Sussex Healthcare NHS Trust have information available to support the safe prescribing and administration of Ferric carboxymaltose (Ferinject®) or Ferric derisomaltose (former brand name Monofer®). That clinicians are aware of what course of action to take in the event of infusion related problems, patients are provided with suitable information ensuring they are informed regarding the rational for the infusion in addition to the likelihood of potential side effects.

3. Scope

This guideline is relevant to all adult areas using Ferric carboxymaltose (Ferinject®) and Ferric derisomaltose (former brand name Monofer®) with the aim of ensuring safe and effective prescribing. This guideline is aimed at doctors, pharmacists and nurses involved in the administration of Ferric carboxymaltose (Ferinject®) and Ferric derisomaltose (former brand name Monofer®) to patients over 18 years of age.

4. Definitions

Iron deficiency anaemia is defined by low iron stores and a low haemoglobin (Hb) that responds to iron therapy (Hb will increase by 10g/L or more over 2 weeks if the patient is iron deficient). Iron deficiency anaemia is defined as Hb <125 g/L in women, Hb< 110g/L in the first trimester, Hb<105 in the second and third trimesters and <100g/l in the post-partum period and Hb <130 g/L in men **PLUS evidence of iron deficiency:**

- Hypochromic and/or microcytic red cell indices (MCH <26.9 pg or MCV <80 fl)
- Low ferritin (ferritin <15ug/L). Ferritin may be elevated in the presence of inflammation. If CRP is high, then still consider iron deficiency as cause of anaemia.
- Low transferrin saturation, low iron, raised total iron-binding capacity.

5. Accountabilities

Patient Consent. As per the vast majority of medical interventions and patient treatments, informed patient consent to infusion of Intravenous Iron product is achieved through effective communication between the patient and their medical and Nursing team. It is best Trust Policy for patients to be supplied with a patient information leaflet, ideally the leaflet **Appendix C** of this policy or the leaflets provided by the Intravenous Iron manufacturers (of product used for patient treatment). **Note:** any leaflet provided should include the possible risk of IV iron treatments including extravasation and skin discolouration or staining.

Medical Staff.

- It is the admitting doctor's responsibility to ensure that treatment with intravenous iron is appropriate and other causes of anaemia have been excluded.

- It is the admitting doctor's responsibility to determine if any of the contraindications or precautions to therapy apply to the patient. They are then responsible for assessing the risk- versus benefit for treatment and documenting this along with proposed treatment plan for the patient.

- It is the initiating doctor's responsibility to ensure that the appropriate monitoring (including haemoglobin and serum ferritin) is performed, reviewed and that the patient is followed up appropriately. The frequency of monitoring will need to be decided on a case-by case basis.

- It is the responsibility of the medical team to ensure that the iron infusion is prescribed.

- It is the medical team's responsibility to ensure that the guideline is followed, and specialist advice requested if required.

- It is the responsibility of the prescriber to ensure than an accurate weight is recorded and used to calculate the dose.

Nursing staff / Midwifery Staff

- It is the admitting nurse's/midwife's responsibility to ensure the weight is accurately recorded on the drug chart to ensure accurate calculation of the iron dose.

- Ensure that the infusion is prepared and administered safely and appropriately.

- The nursing/midwifery staff will inform the patient about the risks including allergy, skin infiltration and discolouration. Patients will be asked to inform them immediately if they experience any pain at the cannula site. A rare side effect of iron infusion can be darkening of all skin tissue (akin to a sun tan). This is self-limiting and resolves over a few weeks.

- It is the responsibility of the discharging nurse/midwife to ensure that patients are supplied with verbal and written information about the treatment**.**

Pharmacy Staff

It is the responsibility of the clinical pharmacist to highlight any deviation from the guideline to the patient's medical team.

6. Process

a) The doctor and nurse/midwife must ensure that adrenaline, IV steroids and IV antihistamines are available prior to administration, and that staff are fully versed in the management of minor to major allergic reactions should they occur.
b) Based on the patient's weight and BMI the doctor prescribes the appropriate IV iron and dose.
c) Ferric carboxymaltose (Ferinject®) using table below.
d) Ferric derisomaltose (former brand name Monofer®) using either the simplified dosing tables or using the Ganzoni formula as outlined within Appendix B. If using the Ganzoni formula the dose should be rounded to the nearest 10mg. The prescribing doctor should ensure that the dilution/ rate of infusion is appropriate for the patient's fluid status and the dose prescribed.
e) The nursing/midwifery staff must then ensure that the necessary pre-infusion monitoring has been completed, this will include baseline observations, blood pressure, pulse, temperature,

oxygen saturations and respiratory rate. This is to be repeated post infusion or on event of needing to stop the infusion due to clinical concern.

f) Patients should remain in the ward or department for at least 30 minutes following the completion of the infusion.

g) Patients should be advised not to take their oral iron tablets for 24 hours pre-infusion and 5 days post infusion. They should be provided with the information leaflet. A blood test form should be provided prior to discharge, if clinically indicated, and the patient instructed when this should be undertaken. Interpretation and follow up of blood test results lies with the overseeing clinical team.

7. Special Considerations and precautions for use

Parenterally administered iron preparations can cause hypersensitivity reactions including serious and potentially fatal anaphylactic reactions. The risk is enhanced for patients with:

- Known allergies including drug allergies.
- History of severe asthma, eczema or other atopic allergy
- Immune or inflammatory conditions e.g., rheumatoid arthritis

Parenteral iron should be used with caution if acute or chronic infection present.

Pregnancy and the Need for Intra-venous Iron Infusion.

Please note: East Sussex Healthcare NHS Trust Obstetrician leads have instructed that all Iron Infusions in pregnancy should be administered in Maternity Day Assessment or the Frank Shaw Ward.

In pregnancy, in addition to performing and recording maternal observations (including blood pressure, pulse rate and temperature), the midwife should listen and record the foetal heart rate, before and after the Iron Infusion is administered (via sonicaid- for at least 1 minute)

Hypersensitivity Reactions in Pregnancy whilst receiving an Intravenous Iron Infusion

In Pregnancy if there is a suspicion of mild moderate or severe infusion reaction associated with Intravenous Iron product infusion then a Cardiotocography (CTG) should be commenced to ensure foetal wellbeing.

Please see specific products Characteristics (SPC's) for Iron product for use to ascertain dosing guidelines in Pregnancy.

8. Evidence Base/References

Ferric carboxymaltose | Drugs | BNF | NICE

Ferric derisomaltose Pharmacosmos 100 mg/ml solution for injection/infusion. Last updated 30th Jan 2023. Accessed via Ferric derisomaltose Pharmacosmos 100 mg/ml solution for injection/infusion - Summary of Product Characteristics (SmPC) - (emc) (medicines.org.uk)

Ferinject 50 mg iron/mL dispersion for injection/infusion. Vifor Pharma UK Limited. Last updated 3rd Aug 2023 Accessed via Ferinject 50 mg iron/mL dispersion for injection/infusion. - Summary of Product Characteristics (SmPC) - (emc) (medicines.org.uk)

Rampton, D. et al.Hypersensitivity reactions to intravenous iron: guidance for risk minimization and management. Haematologica. Nov 2014; 99(11):1671–1676.

NICE Clinical Knowledge Summaries. Anaemia-Iron deficiency. Last revised April 2023. Accessed via **https://cks.nice.org.uk/anaemia-iron-deficiency**

9. Competencies and Training Requirements

All clinical staff on induction receive training on the use of the medicines management policies and supporting procedures. FY1 Prescribing doctors undertake a prescribing assessment when they start at ESHT. Nursing staff are assessed as competent in medicine administration and are expected to follow a validation process prior to undertaking injections.

10. Monitoring arrangements:

Document Monitoring Table

Element to be Monitored	Lead	Tool for Monitoring	Frequency	Responsible Individual/Group/ Committee for review of results/report	Responsible individual/ group/ committee for acting on recommendations/action plan	Responsible individual/group/ committee for ensuring action plan/lessons learnt are Implemented
Incidents involve infusion related reactions	MSO	[redacted] incident reporting	Monthly	Medicines Safety Group	Medicines Safety Group	Medicines Optimisation Group

Appendix A: Equality and Health Inequalities Impact Assessment (EHIA) template

Undertaking EHIA helps us to make sure that our services and polices do not inadvertently benefit some groups more than others, ensuring that we meet everyone's needs, and our legal and professional duties.

This is important because:

- **Assessing the potential for services and policies to impact differently on some groups compared with others is a legal requirement.**
- **People who find it harder to access healthcare services are more likely to present later when their disease may be more progressed, have poorer outcomes from treatment, and need more services than other groups who have better access.**

The Equality Act 2010 legally protects people from discrimination in the workplace and in wider society. It is against the law to discriminate against anyone because of:

- **age**
- **gender reassignment**
- **being married or in a civil partnership**
- **being pregnant or on maternity leave**
- **disability**
- **race including colour, nationality, ethnic or national origin**
- **religion or belief**
- **sex**
- **sexual orientation.**

These are called 'protected characteristics'. The Act requires that public sector organisations meet specific equality duties in respect of these protected characteristics. This is known as the public sector equality duty.

Public Sector Equality Duty
Public bodies have to consider all individuals when carrying out their day-to-day work – in shaping policy, in delivering services and in relation to their own employees.

Public bodies must have due regard to the need to:

- **eliminate discrimination**
- **advance equality of opportunity**
- **foster good relations.**

Armed Forces Covenant Duty

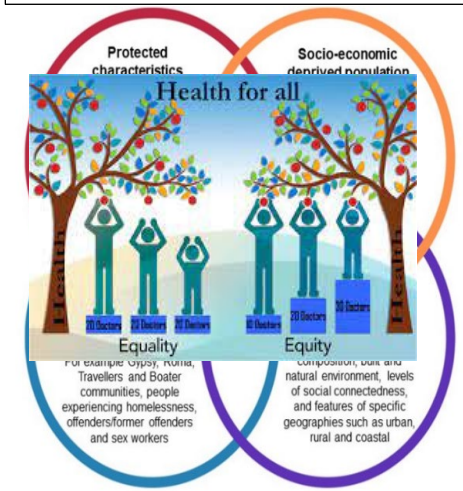
The new Covenant Duty raises awareness of how Service life can impact on the Armed Forces community, and how disadvantages can arise due to Service when members of that community seek to access key local services. The Duty requires organisations to pay due regard to the Covenant principles when exercising functions in healthcare. "Due regard" means that we need to consciously consider the unique obligations and sacrifices made by the Armed Forces; that it is desirable to remove disadvantages faced by the Armed Forces community; and that special provision may be justified in some circumstances.

Health Inequalities Duties- Equity for all
In addition to our legal duties in relation to Protected Characteristics, the Health and Social Care Act and other legislation, NHS Planning Guidance and sector specific recommendations require the NHS to have regard to the need to address health inequalities (or differences in access to or outcomes from healthcare) and take specific action to address them.

Figure 1 shows the different population groups, factors associated with where we live, or our individual circumstances, which separately, or when combined, influence access to and outcomes from health care.

Getting equal outcomes may require different inputs (or services). In completing an EHIA its important to think about whether a one size fits all approach will generate the same good outcomes for everyone, or whether we might need to make some tweaks or adjustments to enable everyone to benefit equally. The health tree diagram shows that unless we think about the needs of different people, equal services might generate unequal outcomes.

Factors associated with poorer health outcomes (PHE 2021)[1]



The Health Tree[1]
The following principles, drawn from case law, explain what we must do to fulfil our duties under the Equality Act:

- **Knowledge:** everyone working for the Trust must be aware of our equality duties and apply them appropriately in their work.
- **Timeliness:** the duty applies at the time of considering policy options and/or before a final decision is taken – not afterwards.
- **Real Consideration:** the duty must be an integral and rigorous part of your decision-making and influence the process.
- **Sufficient Information:** you must assess what information you have and what is needed to give proper consideration.
- **No delegation:** the Trust is responsible for ensuring that any contracted services which provide services on our behalf can comply with the duty, are required in contracts to comply with it, and do comply in practice. It is a duty that cannot be delegated.
- **Review:** the equality duty is a continuing duty. It applies when a policy/process is developed/agreed, and when it is implemented/reviewed.
- **Proper Record Keeping:** to show that we have fulfilled our duties we must keep records of the process and the impacts identified.

NB: Filling out this EHIA in itself does not meet the requirements of the equality and health inequalities duties. All the requirements above must be fulfilled or the EHIA (and any decision based on it) may be open to challenge. Properly used, an EHIA can be a tool to help us comply with our equality and health inequalities duty and as a record that to demonstrate that we have done so. It is advised that you complete the short EHIA training session on [redacted] before completing this EHIA.

SECTION A ADMINISTRATIVE INFORMATION

This form is a central part of how the Trust makes sure and can demonstrate to others that we are meeting our legal duties; and how we can assure ourselves that all patients will get the best outcome for them from our services.

[1] https://www.researchgate.net/figure/Equality-and-equity-of-medical-resources-distribution_fig2_323266914

A completed copy of this form must be provided to the decision-makers in relation to your proposal. The decision-makers must consider the results of this assessment when they make their decision about your proposal.	**Intravenous Iron Supplementation- Adult Prescribing and Administration Guidelines**
Function/policy/service name and number:	
Main aims and intended outcomes of the function/policy/service and summary of the changes you are making (if existing policy/service):	The aim of the Intravenous Iron Supplementation-Adult Prescribing and Administration Guidelines Trust Policy is to provide clinical governance and documented best practice for the use of Intravenous Iron infusions within the NHS Trust. The aim is to ensure all key medical and Nursing staff have access to this guidance to aid best practice.
How will the function/policy/service change be put into practice?	This policy: Intravenous Iron Supplementation-Adult Prescribing and Administration Guidelines Trust Policy will be available to staff to provide clinical governance and documented best practice.
Who will be affected/benefit from the policy?	Patients with diagnosed Iron Deficiency Anaemia who require Intravenous Iron replacement. Medical and Nursing staff undertaking their medical care will have access at their fingertips (Trusts Policies accessed through Extra-net IT system) to agreed evidence based Trust best practice.
State type of policy/service	Policy : Administration Policy and Prescribing Policy. / Service ☐ Provision of safe medical interventions / Update on existing Trust Policy 9expired October 2023) to reflect changes in best practice and updates including product name changes. / Business Case ☐ / Function ☐ Existing
Is an EHIA required? NB :Most policies/functions will require an EA with few exceptions such as routine procedures	Yes ☐ EHIA should be completed. No ☐ (If no state reasons)
Accountable Director: (Job Title)	Update to Policy overseen by [redacted] with support of healthcare professionals listed in Consultation table.
Assessment Carried out by:	Name: Lead Nurse [redacted] with support from [redacted].
Contact Details:	ESHT Transfusion Lead , Haematology Department
Date Completed:	February 28th 2024

SECTION B ANALYSIS AND EVIDENCE

Analysis of the potential impact – Equality and Health Inequalities Duties
For this section you will need to think about all the different groups of people who are more likely to experience poorer access or have poorer outcomes from health and care services. For each group please describe in the first column the potential impact you have identified, in the second column explain how you have arrived at this conclusion and what information you used to identify the potential impact, and in the third column say what you are going to do to prevent it from happening, or which elements of a service or policy specifically address the potential impact. Key things to remember.

- **Everyone has protected characteristics but some groups who share one or more protected characteristics may be more likely to have poorer outcomes or access compared with others – and it is this potential that the EHIA process seeks to identify and address.**
- **The information included here should be proportionate to the type and size of the policy/service/change.**
- **An update to a policy should demonstrate that you have considered the potential for the policy to impact differently on different groups and taken steps to address that.**
- **A minor policy update is likely to need to be much less comprehensive than an EHIA for a major service change.**
- **You will need to know information about who uses or could use your service/policy will apply to (the population). You can use information about current patients or staff, and about the general population the Trust serves.**

3. PROTECTED CHARACTERISTICS - Main potential positive or negative impact of the proposal for protected characteristic groups summarised
Please write in the box below a brief summary of the main potential impact (positive or negative) Please state **N/A if your proposal will not impact adversely or positively on the protected characteristic groups listed below, but make sure you include information on how you know there will be no impact.**

Protected groups	Summary explanation of the tive or adverse impact of your	How do you know this? (include here a brief f what information you have used to identify erse impact e.g. NICE guidance, local data, ews, stakeholder or patient feedback	Action that will be taken to address or negative impact.
Age: older people; middle years; early years; children and young people.	These Prescribing and Administration guidelines has an exclusionary limit of covering the care of adults, 18 and over. This is linked to adhering to best practice provided that was compiled based on the care of Adults.There are no other exclusionary age restrictions	. There is strong evidence that where an NHS workforce is representative of all protected characteristics it fosters a sense of belonging – detailed in the NHS People Plan NHS England » Belonging in the NHS	Lead Haematology teams to keep under review.
Disability: physical, sensory and learning impairment; mental health condition; long-term conditions.	No content in this policy is expected or likely to require review in regard to the needs of disabled service users.	The Workforce Disability Equality Standard, set out by NHS England details the positive association between increased disability equality and workplace experience for disabled individuals	No expected negative impact.
Gender Reassignment and/or people who identify as Transgender	Individual patient assessment, led by Consultants/medical teams will assess medical need and adherence to best practice and clinical guidelines.	Detailed in Creation of Policy IDA Pathway staff to reflect and ensure best practice is taking place . There is strong evidence that where an NHS workforce is representative of all protected characteristics it fosters a sense of belonging – detailed in the NHS People Plan NHS England » Belonging in the NHS	Trust staff caring for patients who may have gender reassignment or identify as transgender must show care and professionalism to support their patient when considering diagnosis parameters and treatment indicators in line with clinical guidance for Male and Female Patients. Alongside best medical care Trust staff must ensure care is inclusive and meets the needs of service uses who have undertaken Gender reassignment or identify as Transgender.
Marriage & Civil Partnership: people married or in a civil partnership.	No identified positive or negative aspect regarding this policy.	There is strong evidence that where an NHS workforce is representative of all protected characteristics it fosters a sense of belonging – detailed in the NHS People Plan NHS England » Belonging in the NHS	N/A

Pregnancy and Maternity: before and after childbirth and who are breastfeeding.	During creation of this policy the medical care of Pregnant patients was considered with parameters and restrictions in referral detailed in the policy. These clinical decisions were based on evidenced based agreed best practice.	NICE Guidelines and Specific Product Characteristics for Intra venous Iron Infusion. There is strong evidence that where an NHS workforce is representative of all protected characteristics it fosters a sense of belonging – detailed in the NHS People Plan NHS England » Belonging in the NHS	Clarity of best practice care will aid safe practice and reduce deviation from best practice.
Race:	No identified positive or negative aspect regarding this policy.	The Workforce Race Equality Standard, set out by NHS England details how the positive association between increased race equality and workplace experience for disabled individuals	Continued Monitoring
Religion and belief: people with different religions/faiths or beliefs, or none.	No identified positive or negative aspect regarding this policy.	There is strong evidence that where an NHS workforce is representative of all protected characteristics it fosters a sense of belonging – detailed in the NHS People Plan NHS England » Belonging in the NHS	Intravenous Iron is a synthetic medical product (not a human Blood product). No religious or faith aspects are expected.
Sex:	No identified positive or negative aspects regarding this policy	Agreed medical parameters for IDA in Males and Females to be used in accordance with Best Practice Guidelines and medication administration guidelines.	Continued Monitoring
Sexual orientation	No identified positive or negative aspect regarding this policy	There is strong evidence that where an NHS workforce is representative of all protected characteristics it fosters a sense of belonging – detailed in the NHS People Plan NHS England » Belonging in the NHS	Continued Monitoring
Veterans/Armed Forces Communities	No identified positive or negative aspect regarding this policy	There is strong evidence that where an NHS workforce is representative of all protected characteristics it fosters a sense of belonging – detailed in the NHS People Plan NHS England » Belonging in the NHS	Continued Monitoring

4. HEALTH INEQUALITIES -Potential positive or adverse impact for people who experience health inequalities summarised

Please briefly summarise the main potential impact (positive or negative) on people at particular risk of health inequalities (as listed below). **If the policy/procedure is unrelated to patients, this sections does not require completion.**

Please state none if you have assessed that there is not an impact, but please make sure you complete the 'how do you know this' column to demonstrate that you have considered the potential for impact**. If you identify the potential for impact for one or more of these groups please complete the full assessment in Appendix A**

Groups who face health	Summary explanation of the potential verse impact of your proposal	How do you know this? (include xplanation of what information you identify potential adverse impact e.g. ce, local data, evidence reviews, r patient feedback	Action that will be taken e potential for negative
This includes all groups of people who may have poorer access to or outcomes from healthcare services. It includes: People who have experienced the care system; carers; homeless people; people involved in the criminal justice system; people who experience substance misuse or addiction; people who experience income or other deprivation; people with poor health literacy; people living in rural areas with limited access to services; refugees or asylum seekers; people in or who have been in the armed force; other groups who you identify as potentially having poorer access and outcomes.	No identified concerns, adherence to this best practice policy will ensure the safest care is administered to all Trust Patients who require an Intravenous Iron Infusion.	There is strong evidence that where an NHS workforce is representative of all protected characteristics it fosters a sense of belonging – detailed in the NHS People Plan NHS England » Belonging in the NHS	Continued monitoring

SECTION C ENGAGEMENT

5. Engagement and consultation

a. Talking to patients, families and local communities can be a rich source of information to inform health care services. If you are making substantial changes it's likely that you'll have to undertake specific engagement with patients. For smaller changes and policies your may have undertaken some engagement with patient groups, gained insight from routine sources e.g. patient surveys, PALS or Complaints information or information from Healthwatch, you may also have looked at relevant engagement that others have undertaken in the Trust, or locally
Have any engagement or consultative activities been undertaken that considered how to address equalities issues or reduce health inequalities? Please place an x in the appropriate box below.

	No

b. If yes, please ensure all stakeholders are listed in the consultation table at the beginning of the policy.

SECTION D SUMMARY OF FINDINGS

Reflecting on all of the information included in your review-

6. EQUALITY DUTIES: Is your assessment that your proposal will support compliance with the Public Sector Equality Duty? Please **add an x** to the relevant box below.

	Tackling discrimination	Advancing equality of opportunity	Fostering good relations
The proposal will support?			
The proposal may support?			
Uncertain whether the proposal will support?			

7. HEALTH INEQUALITIES: Is your assessment that your proposal will support reducing health inequalities faced by patients? Please add an x to the relevant box below.

	Reducing inequalities in access to health care	Reducing inequalities in health outcomes
The proposal will support?		
The proposal may support?		
Uncertain if the proposal will support?		

8. Outstanding key issues/questions that may require further consultation, research or additional evidence. Please list your top 3 in order of priority or state N/A

Key issue or question to be answered		Type of consultation, research or other evidence that would address the issue and/or answer the question
1		
2		
3		

9. EHIA sign-off: (this section must be signed)

Person completing the EHIA:	[redacted] **RGN**	**Date:28/2/24**
Line Manager of person completing:		**Date:**

Appendix A

Breakdown of Groups who are more likely to experience health inequalities:

Groups who face health	Summary explanation of the tive or adverse impact of your	How do you know this? (include xplanation of what information you identify potential adverse impact e.g. ce, local data, evidence reviews, r patient feedback	Action that will be taken to address the egative impact.
Looked after children and young people	None expected	Guidelines are for the care of Adults.	**Continued Monitoring**
Carers of patients	None expected.	Guidelines will provide healthcare staff with best practice instruction. this will benefit all patients.	Continued Monitoring

Homeless people. People on the street; staying temporarily with friends /family; in hostels or B&Bs.	None expected.	Guidelines will provide healthcare staff with best practice instruction. this will benefit all patients.	**Continued Monitoring**
People involved in the criminal justice system: offenders in prison/on probation, ex-offenders.	None expected	There is strong evidence that where an NHS workforce is representative of all protected characteristics it fosters a sense of belonging – detailed in the NHS People Plan NHS England » Belonging in the NHS	Continued Monitoring
People with addictions and/or substance misuse issues	None expected	There is strong evidence that where an s representative of all protected fosters a sense of belonging – detailed in Plan NHS England » Belonging in the NHS	Continue to monitor
People or families on a low income	None expected	There is strong evidence that where an NHS workforce is representative of all protected characteristics it fosters a sense of belonging – detailed in the NHS People Plan NHS England » Belonging in the NHS	**Continued Monitoring**
People with poor literacy or health Literacy: (e.g. poor understanding of health services poor language skills).	None expected	There is strong evidence that where an NHS workforce is representative of all protected characteristics it fosters a sense of belonging – detailed in the NHS People Plan NHS England » Belonging in the NHS	**Continue to monitor**
People living in deprived areas	None expected	There is strong evidence that where an NHS workforce is representative of all protected characteristics it fosters a sense of belonging – detailed in the NHS People Plan NHS England » Belonging in the NHS	Continued Monitoring
People living in remote, rural and island locations	None expected	There is strong evidence that where an NHS workforce is representative of all protected characteristics it fosters a sense of belonging – detailed in the NHS People Plan NHS England » Belonging in the NHS	Continued Monitoring
Refugees, asylum seekers or those experiencing modern slavery	None expected	There is strong evidence that where an NHS workforce is representative of all protected characteristics it fosters a sense of belonging – detailed in the NHS People Plan NHS England » Belonging in the NHS	Continued Monitoring
People who have served in the Armed Forces	None expected	There is strong evidence that where an NHS workforce is representative of all protected characteristics it fosters a sense of belonging – detailed in the NHS People Plan NHS England » Belonging in the NHS	

Other groups experiencing health inequalities (please describe)	None expected	There is strong evidence that where an NHS workforce is representative of all protected characteristics it fosters a sense of belonging – detailed in the NHS People Plan NHS England » Belonging in the NHS	

Appendix B – EHIA Resources
Sources of Information on the East Sussex population and sources of community or patient insight.

Population Data
State of the County 2021 Focus on East Sussex

East Sussex JSNA

Community Insight

Further Reading on Equality and Health Inequalities

Training

Appendix B: Summary of Intravenous Iron: Ferric derisomaltose (former brand name Monofer®) Prescribing and Administration Guidelines

Indications for use

Iron deficiency when:

- **oral iron preparations are ineffective or cannot be used (e.g., intolerance in inflammatory bowel disease),**
- **where there is a clinical need for rapid iron delivery (e.g., perioperative anaemia, severe anaemia in late pregnancy or postpartum anaemia)**
- **support the use of erythropoiesis stimulating agents (including patients on renal dialysis).**

Contraindications

- **Hypersensitivity to the active substance, to Ferric derisomaltose (former brand name Monofer®)or any of its excipients**
- **Known serious hypersensitivity to other parenteral iron products.**
- **Non-iron deficiency anaemia (e.g., haemolytic anaemia)**
- **Iron overload or disturbances in utilisation of iron (e.g., haemochromatosis, haemosiderosis)**
- **Decompensated liver disease**
- **First trimester of pregnancy**
- **Ongoing bacteraemia**

Use in Children

- Ferric derisomaltose (former brand name Monofer®) is not recommended for use in children and adolescents < 18 years due to insufficient data on safety and efficacy.

Dosing and Frequency of Use: Ferric derisomaltose

The dose of Ferric derisomaltose (former brand name Monofer®) is expressed in milligrams (mg) of elemental iron. The cumulative dose for repletion of iron using Ferric derisomaltose (former brand name Monofer®) is determined based on the patient's body weight and haemoglobin (Hb) level and must not be exceeded. It is the prescriber's responsibility to ensure this is done correctly. The following table should be used to determine the cumulative iron dose for patients weighing 50kg or more:

Simplified Ferric derisomaltose (former brand name Monofer®) **Dosing in Adults**

Hb (g/L)	Patients with bodyweight 50 kg to <70 kg	Patients with body weight ≥70 kg
≥ 100	1000 mg	1500 mg
< 100	1500 mg	2000 mg

It is recommended that the Ganzoni formula is used for patients who are likely to require individually adjusted dosing such as patients weighing <50kg.

Simplified Ferric derisomaltose (former brand name Monofer®) **Dosing in Pregnancy**

Hb (g/L)	Patients with booking body weight 50kg to <75kg	Patients with booking body weight ≥ 75kg
≥ 100	1000 mg	1500 mg
< 100	1500 mg	2000 mg

It is recommended that the Ganzoni formula is used for patients who are likely to require individually adjusted dosing such as patients weighing <50kg.

Note:

- Actual body weight should be used for patients with body mass index (BMI) <30.
- Ideal body weight should be used for obese patients (BMI >30)
- Maximum dose is 20mg/kg in a single infusion.
- If the cumulative iron dose exceeds 20mg/kg it must be delivered in divided infusions 1 week apart. This can be done by giving half of the dose on each day, or by giving up to 20mg/kg in the first infusion and the remainder in the second infusion. Alternatively, Hb can be repeated 2 weeks post 20mg/kg maximum infusion and further infusion arranged only if anaemia persists.

Patient monitoring before the infusion

- **The patient's haemoglobin level should be checked and recorded on the drug chart before the first dose is given.**
- **A set of observations (including blood pressure, pulse rate and temperature) and the NEWS score should be measured and recorded before administration. If the patient has any signs or symptoms of infection alert the admitting doctor who will decide whether it is appropriate to delay giving the dose until any infection has resolved.**
- **Ensure that adrenaline is available prior to administration as acute severe anaphylactoid reactions may occur although they are not common and typically occur in the first few minutes are administration (see Grading and Management of acute hypersensitivity reactions)**

Ferric derisomaltose (former brand name Monofer®)
Ferric derisomaltose (former brand name Monofer®) 100mg/ml solution for injection/infusion contains 100mg iron in 1ml. This is available as 1ml, 5ml and 10ml ampoules.

- Doses up to 1000 mg must be administered over more than 15 minutes.
- Doses exceeding 1000 mg must be administered over 30 minutes or more.
- Ferric derisomaltose (former brand name Monofer) should be added to a minimum 100ml and maximum 500 ml sterile 0.9% sodium chloride.

Advice post iron infusion

- **Patients should remain in the ward or department for at least 30 minutes following completion of the infusion.**
- **Patients should be advised not to take their oral iron tablets for 24 hours pre- infusion and 5 days post infusion.**
- **Some improvement in haemoglobin (Hb) level should be observed after 2 weeks, optimum improvement at 4 weeks. It may be necessary to recheck haemoglobin and review haematinics one to two months following infusion to ensure continued improvement. A blood test form should be provided prior to discharge with clear instructions to the patient.**

Grading and Management of acute hypersensitivity reactions

Safety data indicates that often minor infusion related reactions are mismanaged. It is therefore crucial that staff administering iron are suitably trained in minor, moderate and severe infusion related reactions. Suggested management is outlined below and summarised in diagram 1.

Mild reactions include:
Itching, flushing, urticarial, sensation of heat, slight chest tightness, hypertension and back and joint pain
Appropriate management of a mild reaction would be to stop the iron infusion for a minimum of 15 minutes. The patient's pulse, blood pressure, respiratory rate and oxygen saturation should be measured. Administration of oral paracetamol and IV chlorphenamine could be considered. Once the patient has recovered the infusion should be continued but at a reduced infusion rate (e.g., 50%)

Moderate infusion reactions:
(as in mild reactions) but also transient cough, flushing, chest tightness, nausea, shortness of breath, tachycardia and hypotension.
Appropriate management of a moderation infusion reaction would be to stop the infusion and consider IV chlorphenamine and IV steroids. The patient should be observed for 1-4 hours, and the events documented and the future strategy for treatment discussed.

Severe/life threatening:
Sudden onset and rapid aggravation of symptoms + wheezing/stridor, periorbital oedema, cyanosis, cardiac/respiratory arrest
Appropriate management is to stop infusion immediately. Give adrenaline and IV steroid.
The patient should be observed for 1-4 hours, and the reaction documented.

Dosing and Frequency of Use: Ferric carboxymaltose (Ferinject®)

The cumulative dose for repletion of iron using Ferric carboxymaltose (Ferinject®) is determined based on the patient's body weight at booking and haemoglobin (Hb) level. If the BMI is more than 30 then ideal body weight should be used to calculate the dose.

Hb (g/L0	Patients with bodyweight 35 – 70kg	Patients with bodyweight ≥ 70kg
< 100	1000mg day 1 500mg day 8	1000mg day 1 1000mg day 8
≥ 100	1000mg day 1	1000mg day 1 500mg day 8

The maximum dose given at one time should not exceed 20mg/kg.

- Booking weight <35kg: Cumulative iron dose 500mg should NOT be exceeded.
- Booking weight >35kg but <50kg: The maximum dose to be given at any one time must not exceed 20mg/kg body weight.
- A single dose of Ferric carboxymaltose (Ferinject®) should not exceed 1000mg of iron (20ml) per day.
- Do not administer 1000mg of iron (20ml) more than once a week.

Treatment of IDA in Pregnancy: Ferric carboxymaltose (Ferinject®) is indicated in the following circumstances:

- Hb<105g/L in 2nd and 3rd trimesters
- Demonstrated intolerance to oral iron preparations.
- Where there is a clinical need to deliver iron rapidly to iron stores.
- Demonstrated lack of effect of oral iron therapy.

Post-Partum:

- Postpartum Hb < 100g/L
- Ferric carboxymaltose (Ferinject®) can be secreted in the breast milk.

Prophylactic Treatment in pregnancy:

- Use of prophylactic treatment with nor Hb range from 110-140g/L
- Ferric carboxymaltose (Ferinject®) infusion should be considered:

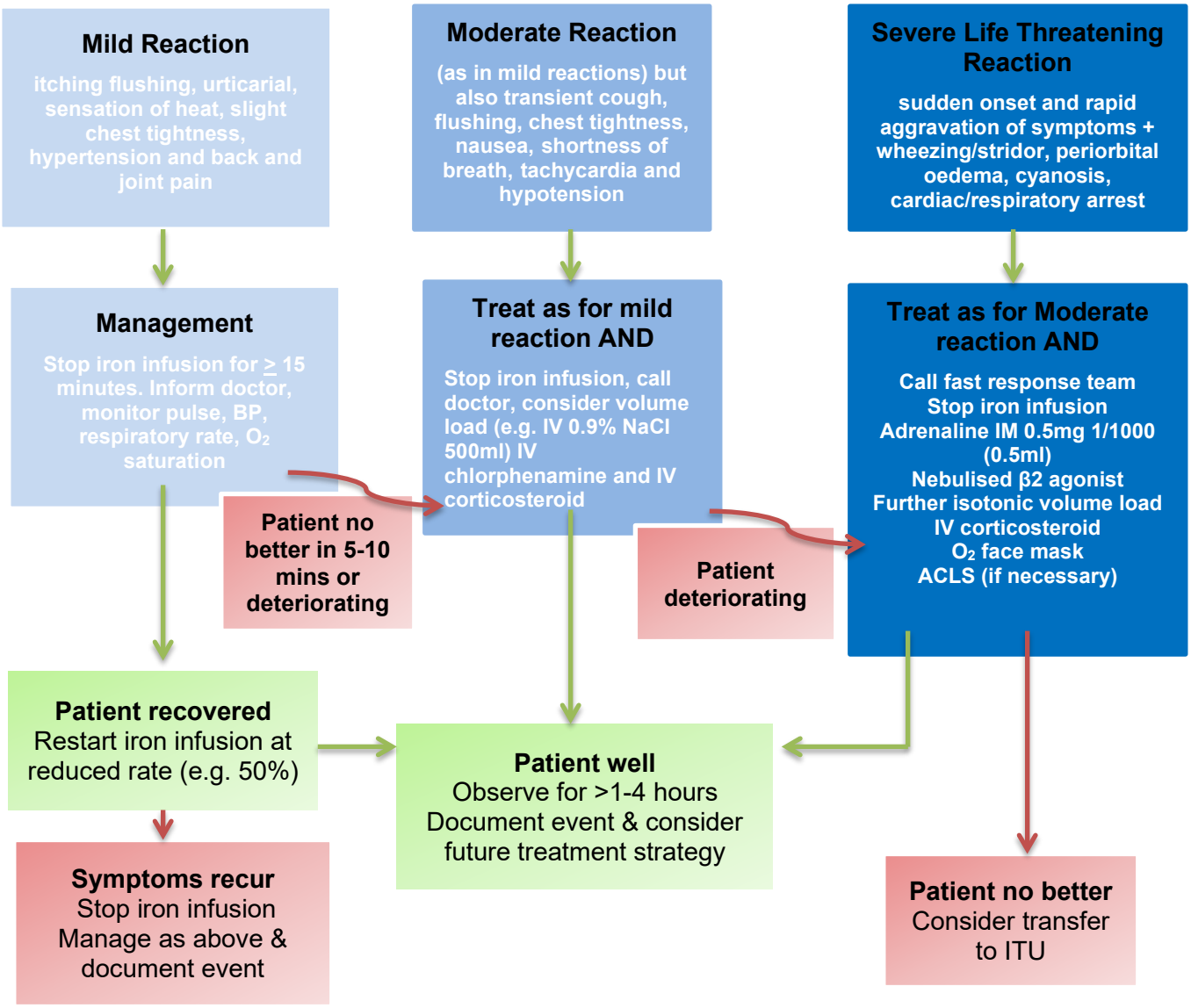
i)Multiple pregnancies, grand multiparity, placenta previa and High Post Partum Haemorrhage (PPH)
ii) Jehovah's Witness

Administration Guidelines:
Ferric Carboxymaltose (Ferinject®)

- Each 2 mL vial contains 100 mg of iron as ferric carboxymaltose.
- Each 10 mL vial contains 500 mg of iron as ferric carboxymaltose.
- Each 20 ml vial contains 1,000 mg of iron as ferric carboxymaltose.
- Do not dilute to concentrations less than 2mg of iron per ml.

Ferrinject®	Iron	Amount of NaCl 0.9%	Minimum administration time
2-4mls	100-200mg	50mls	2 minutes
4-10mls	200 – 500mg	100mls	6 minutes
10-20mls	500-1000mgs	250mls	15 minutes

Diagram 1: Management of acute hypersensitivity reactions



Further information regarding hypersensitivity information can also be obtained from the MHRA Advice: Intravenous iron and serious hypersensitivity reactions: Clarification of advice on new recommendations regarding initial test dose.

Appendix C: Patient Information Leaflet

Patient information

NHS
East Sussex Healthcare
NHS Trust

Treatment of iron deficiency anaemia with intravenous iron

What treatment has been recommended?

Your medical team have recommended intravenous iron to treat your anaemia / low blood count.
This will be given as an infusion/drip over 15 or 30 minutes. Please read the following information prior to your treatment and if you have any questions let the nurse caring for you know.

Why do I need intravenous iron?

1. Intravenous iron is used to treat a low blood count due to a low amount of iron in your body. This may have occurred due to low amounts of iron in your diet, a problem with your body's ability to absorb and use iron or be as a result of blood loss.

2. Intravenous iron is a highly effective method to replenish your body's stores of iron and hopefully allow you to increase your blood count over the coming days and weeks.

3. Intravenous iron allows a much larger dose of iron to be given than iron in tablet form.

4. All medication carries a risk of side effects and reaction. Prior to receiving your treatment it is important you are aware of the side effects / risks of intravenous iron. The nurse caring for you will ask if you understand the information below and are content to proceed prior to your treatment.

What are the symptoms that have led to me having this treatment?

Symptoms can include: tiredness and lack of energy, shortness of breath, noticeable heartbeats (heart palpitations), pale skin.

Some people may not have any symptoms and it may be that your anaemia was diagnosed following a blood test.

What are the alternatives?

Oral iron is used initially to treat iron deficiency anaemia. Sometimes this does not produce enough of an improvement or it may be that your doctor needs to replenish your iron quickly. Intravenous iron is used when oral iron has been tried or if it is not suitable and it helps to reduce the use of blood transfusions.

What are the potential risks and side effects?

Intravenous iron is an extremely safe and effective therapy. Some of the side effects that have been reported are:

1. Staining – If your cannula was to displace from your vein during treatment the drug could be deposited in your skin rather than into your bloodstream. This could result in a brown stain to the skin. If you notice pain at the injection site during your treatment please inform the nurse caring for you immediately. This will minimise any such risk.

2. Change in total body skin colour – This is an extremely rare occurrence. It has been reported that some patients noted their skin to become darker (like a suntan) for a period of weeks after treatment with intravenous iron. This was not permanent and resolved after several weeks.

3. Allergy – Historically intravenous iron preparations carried a risk of allergy (ranging from a mild reaction like itchy skin through to anaphylaxis that could be life threatening). With today's modern iron preparation this is uncommon (1 in a 100 to 1 in a 1000 risk). Please inform the nurse caring for you immediately if you experience any of the following during your treatment (swelling of lips, tongue, face or throat, shortness of breath, itching, a feeling of all over body heat, heart racing heat or faint like symptoms)

4. Delayed reaction – Although uncommon, some patients may experience muscle or joint pains and fever in the days after treatment. This usually lasts two to four days and can be managed with simple painkillers like paracetamol.

Iron infusions are commonly used after the first trimester in pregnancy.

It is important that you also read the patient information leaflet for the product.

What are the expected benefits of treatment?

Your anaemia/ low blood count is expected to improve

What should I do before I come into hospital?

If you are taking oral iron you should stop this the day before you come in to hospital for your iron infusion

Where will the procedure take place?

On the ward whilst you are a hospital in-patient or one of our out-patient units

Will I have an anaesthetic?

No

How will I feel afterwards?

You may rarely experience muscle or joint pains, these can be managed with simple painkillers such as paracetamol.

How long will I be in hospital?

You will need to come in to hospital for a short period of time before the infusion, for the duration of the infusion and you will then be asked to stay for further monitoring for about 30 minutes after the infusion

What should I do when I go home?

For out-patients you should be able to go home the same day.

How soon will I be able to resume normal activities?

It is not anticipated that your iron infusion will affect your ability to undertake your usual activities

Will I have to come back to hospital?

Your nurse will let you know if you need to come back for a further infusion in about a weeks time and they may advise you at this time regarding any blood tests that are needed

When can I return to work?

It is not anticipated that your iron infusion will affect your ability to undertake your usual activities.

Consent

Although you consent for this treatment, you may at any time after that withdraw such consent. Please discuss this with your medical team.

Sources of information

E.g., specialist nurse, ward, consultant secretary, self-help group, national bodies or Web site addresses.

Important information

The information in this leaflet is for guidance purposes only and is not provided to replace professional clinical advice from a qualified practitioner.

Your comments

We are always interested to hear your views about our leaflets. If you have any comments, please contact the Patient Experience Team – Tel: [redacted] or by email at: esh-tr.patientexperience@nhs.net

Hand hygiene

The Trust is committed to maintaining a clean, safe environment. Hand hygiene is very important in controlling infection. Alcohol gel is widely available at the patient bedside for staff use and at the entrance of each clinical area for visitors to clean their hands before and after entering.

Other formats

If you require any of the Trust leaflets in alternative formats, such as large print or alternative languages, please contact the Equality and Human Rights Department.

Tel: [redacted] Email: esh-tr.AccessibleInformation@nhs.net

After reading this information are there any questions you would like to ask? Please list below and ask your nurse or doctor.

Reference

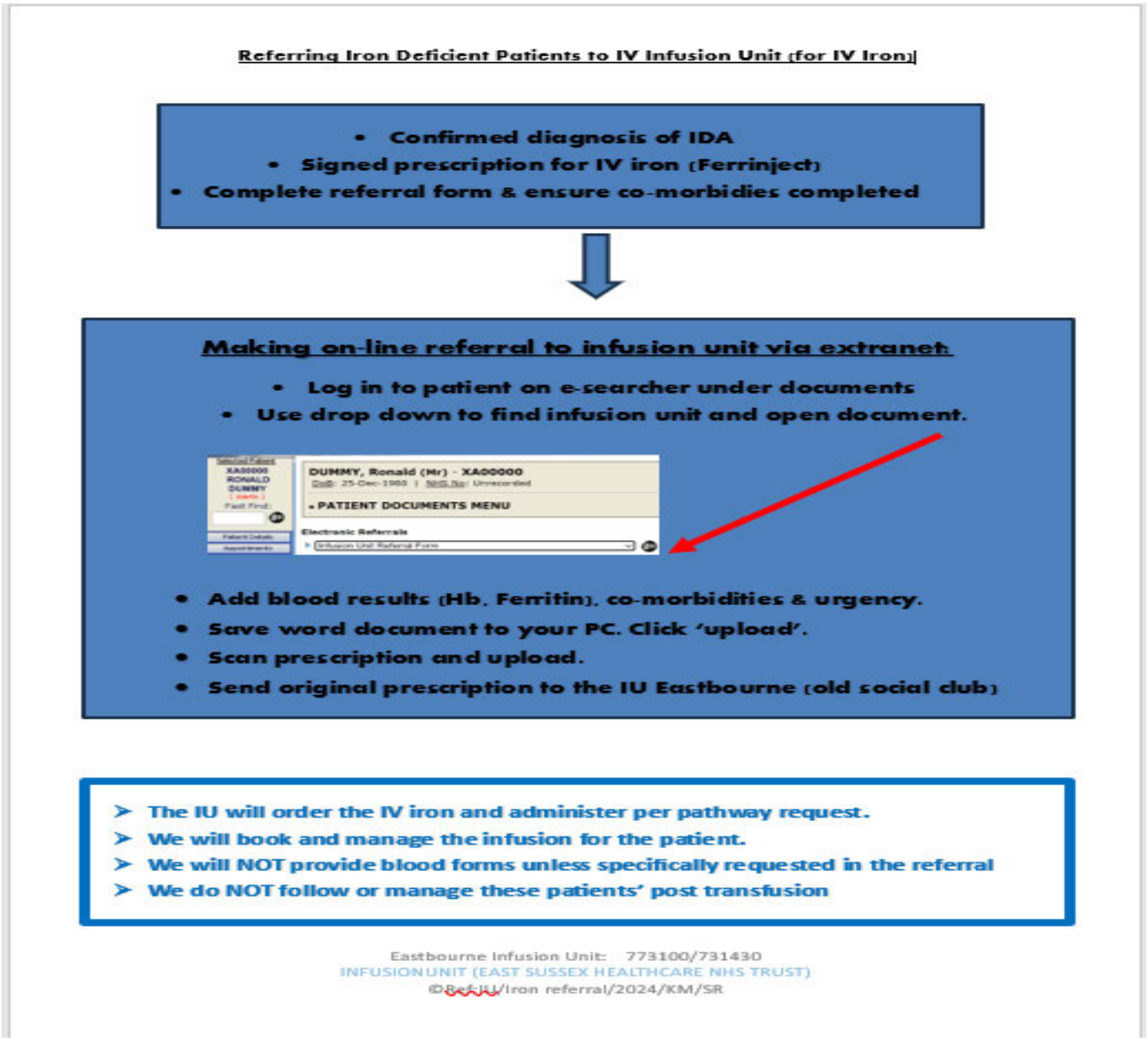
The following clinicians have been consulted and agreed this patient information:
Jane Starr Medication Safety Officer (MSO)

Next review date: March 2026
Responsible clinician/author: Jane Starr Medication Safety Officer (MSO)

Appendix D

Flowchart for referring patient to Infusion Unit (Eastbourne) for IV Iron

Please Note: The Infusion Unit Service at ESHT will routinely treat with Ferric Carboxymaltose (ferinject®) unless specifically instructed to use Ferric Derisomatose (former brand name Monofer®) by the referring clinician.

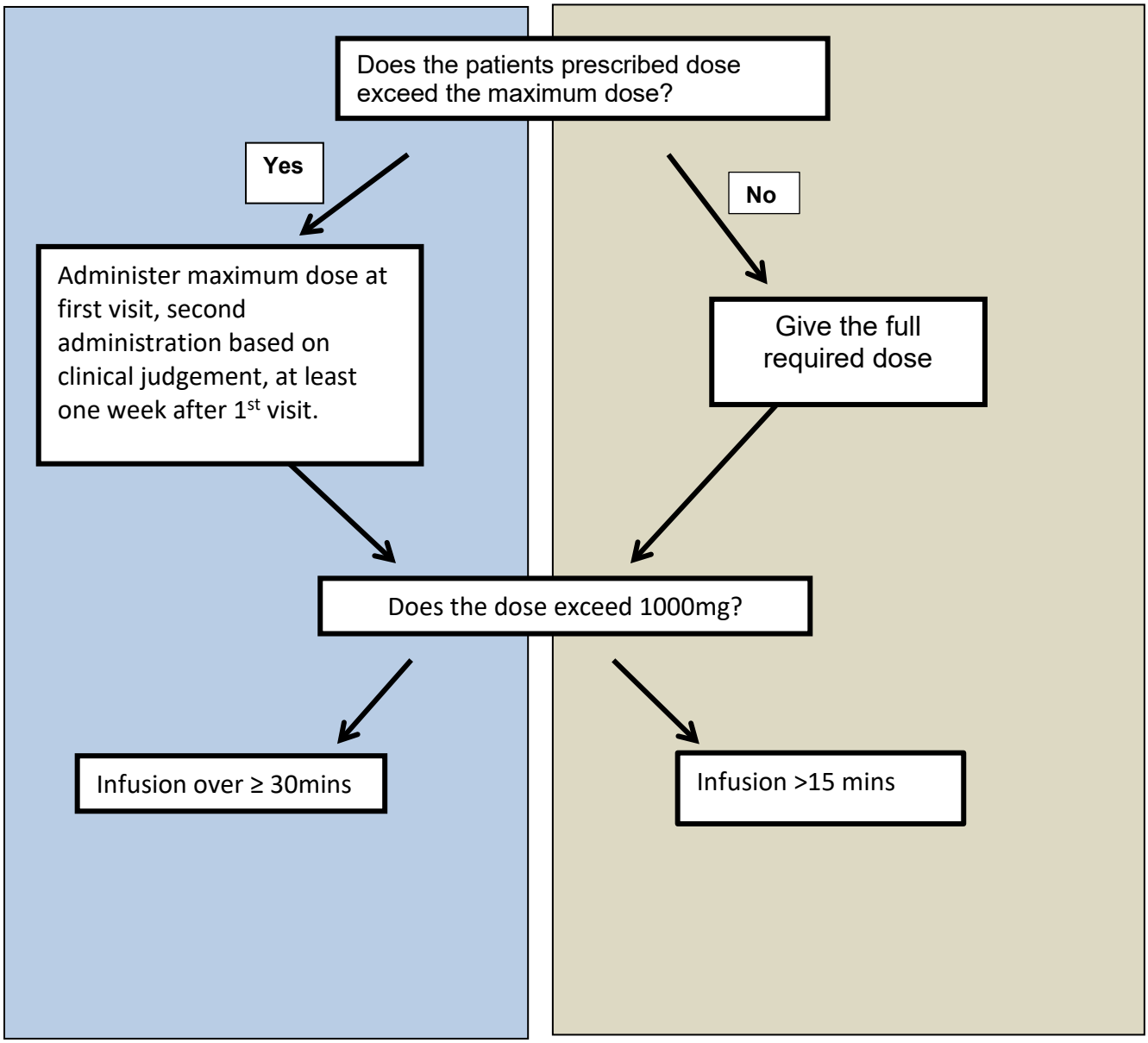


Appendix E: Ferric derisomaltose (former brand name Monofer®0
Dosing Flow Chart

East Sussex Healthcare NHS Trust

Maximum dose = 20mg/kg												
Body weight (kg)	**45**	**50**	**55**	**60**	**65**	**70**	**75**	**80**	**85**	**90**	**95**	**100**
Maximum Dose – 1 sitting	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000

1000mg Infusion over >15 mins = > 1000mg Infusion over ≥ 30mins



Appendix F: Prescription Chart

PHARMACOSMOS

Ferric derisomaltose (former brand name **Monofer®**) **Prescription chart (1)**

Patient Name: Address: DOB: Hospital No: NHS No:	Allergies		Ward	Blood results	Hb (g/L)	Ferritin (micrograms/L)
		Patient's weight (kg) Height (cm) BMI	Consultant	Date		

Dose of Ferric derisomaltose = 20mg/kg. Calculate dose using Ganzoni formula if weight < 50kg			
Hb (g/L)	**< 50kg**	**50kg to < 70kg (Obstetric use 50kg to < 75kg using booking weight)**	**≥70kg (Obstetric use ≥75kg using booking weight)**
≥ 100	20mg/kg	1g	1.5g
< 100	20mg/kg	1.5g	2g

Note:

- Use actual body weight (ABW) for patients with body mass index (BMI) <30 and ideal body weight (IBW) for patients with BMI >30
- **Administer doses ≤ 1000mg over at least 15 mins, doses > 1000mg over at least 30 mins**.
- Parenterally administered iron preparations can cause hypersensitivity reactions.
- **Patients must have blood pressure and pulse checked for at least 30 minutes following infusion.**
- Fluid restricted patients can have the dose administered in 100ml sodium chloride 0.9%

Prescription 1 If total Ferric derisomaltose (former brand name Monofer®) Treatment requires splitting over two treatment dates, 7+days apart, use prescription 1 **& 2** (overleaf)										
Date	Drug	Dose	Infusion fluid	Rate	Batch Number	Given by:	Checked by:	Pharmacy use only		
	Ferric derisomaltose		Sodium Chloride 0.9% 250ml					Clinical check	Dispensed	Checked

Prescriber PRINT name and signature		Bleep no		Date	

Ferric derisomaltose vial sizes: 1ml = 100mg iron 5ml = 500mg iron 10ml= 1000mg iron

If the total iron requirements are greater than 20mg/kg give the first infusion at a dose of 20mg/kg, the remaining dose may be given after an interval of at least 1 week depending on clinical judgement.

Intravenous Iron Infusion: Ferric derisomaltose (former brand name Monofer®)

Prescription 2 Only use if total Ferric derisomaltose (former brand name Monofer®) dose exceeds 20mg/kg in a 7-day period and total dose requires splitting over two treatment dates.										
Date	Drug	Dose	Infusion fluid	Rate	Batch Number	Given by:	Checked by:	Pharmacy use only		
	Ferric derisomaltose		Sodium Chloride 0.9% 250ml					Clinical check	Dispensed	Checked

Prescriber PRINT name and signature		Bleep no		Date	

When required medicines						
Adrenaline 1 in 1000 **500 micrograms (0.5ml)** IM STAT Sign Date	Date & Time					
	Sign					
Hydrocortisone 100mg (Max 500mg in 24 hours) IM or slow IV Sign Date	Date & Time					
	Sign					
Paracetamol 1g oral **every 4-6 hours** (Max 4g in 24 hours) **If <50kg 500mg QDS is the maximum daily dose** Sign Date	Date & Time					
	Sign					
Chlorphenamine 10mg IV (Max 40mg in 24 hours) Sign Date	Date & Time					
	Sign					

Calculation of ideal body weight if BMI < 30

Ideal body weight (Kg) = Constant + 0.91 x (Height-152.4)

Where Constant = 50 for men and 45.5 for women

Height in centimetres

Ganzoni formula if weight < 50kg

Iron dose = weight Kg x (Target Hb - Actual Hb g/L) x 0.24 + 500mg

Suggested target Hb = 120g/L

For IV Infusion, Ferric derisomaltose(former brand name Monofer®)should be added to a minimum 100ml and maximum 500ml sterile 0.9% sodium chloride.
IV iron should only be administered when trained staff are present and the patient should be observed for at least 30 minutes following each infusion.

Ferric derisomaltose Vial sizes
1ml = 100 mg iron
5ml = 500 mg iron
10ml =1000 mg iron

Appendix G: Prescribing and Administering information for Ferinject

Appendix 1 Prescribing & Administration Information for Ferinject® (ferric carboxymaltose)

STEP 1 Calculate dose for intravenous infusion

The dose of IV iron must be individually calculated based on a calculation of the patients total iron deficit.

Ferinject® (ferric carboxymaltose) doses for range of Haemoglobin (Hb) and body weight

Weight	Hb < 100g/L		Hb ≥ 100g/L and < 130g/L	
25-34 kg	Week 1	500mg	Week 1	500mg
35-37kg	Week 1	500mg	Week 1	500mg
	Week 2	500mg	Week 2	500mg
	Week 3	500mg		
38-49kg	Week 1	750mg	Week 1	500mg
	Week 2	750mg	Week 2	500mg
50-69kg	Week 1	1,000mg	Week 1	1,000mg
	Week 2	500mg		
≥70kg	Week 1	1,000mg	Week 1	1,000mg
	Week 2	1,000mg	Week 2	500mg

STEP 2 Prescribe on ONCE ONLY section of kardex

The following is an example for a patient who weighs between 35-37kg and has a Hb <100g/L.

ONCE ONLY AND PREMEDICATION DRUGS

DATE	DRUG	DOSE	ROUTE	TIME (24hr)	PRESCRIBER (PRINT & SIGN)	GIVEN BY	TIME GIVEN (24hr)
Week 1	Ferinject® (ferric carboxymaltose)	500mg	IV	09:00	A. Prescriber	A. Nurse	09:00
Week 2	Ferinject® (ferric carboxymaltose)	500mg	IV	09:00	A. Prescriber	A. Nurse	09:00
Week 3	Ferinject® (ferric carboxymaltose)	500mg	IV	09:00	A. Prescriber	A. Nurse	09:00

STEP 3 Prescribe on infusion chart

The table below provides information on the preparation of Ferinject® (ferric carboxymaltose) for a range of doses. This information should be transcribed onto an infusion chart for administration.

Ferinject® (ferric carboxymaltose)

Dose	500mg	750mg	1,000mg	1,500mg	2,000mg
Dose (volume) of 50mg/ml vial	500mg (10ml)	750mg (15ml)	1,000mg (20ml)	Dose must be split. Maximum weekly dose = 1,000mg of iron or 20mg iron/kg body weight	
Infusion fluid	100ml sodium chloride 0.9%*				
Drug concentration	5mg/ml	7.5mg/ml	10mg/ml		
Infusion rate	400ml/hour over 15 minutes				
	Fluid restricted patients: 200ml/hour over 30 minutes				

*Remove the required dose volume (e.g. 10ml for a 500mg dose) from the bag prior to adding Ferinject®

Appendix H: Ferric Carboxymaltose (Ferinject®) Prescription Chart

Patient Name: Address: DOB: Hospital No: NHS No:	Allergies		Ward	Blood results	Hb (g/L)	Ferritin (micrograms/L)
		Patient's weight (kg) Height (cm) BMI	Consultant	Date		

Note:

- **Booking weight <35kg: Cumulative iron dose 500mg should NOT be exceeded.**
- **Booking weight > 35kg but < 50kg: The Maximum dose to be givenat any time must not exceed 20mg/kg body weight.**
- **A single dose of Ferinject® should not exceed 1000mg of iron (20mls of Ferinject) in a 7-day period.**
- **Do not administer 1000mg of iron (20ml) more than once a week.**

HB (g/l)		**Patient body weight**	
		35kg to <70kg	**70kg and above**
<100		1000mg day 1 500mg day 8	1000mg day1 1000mg day 8
>100 -<140		1000mg day 1	1000mg day 1 500mg day 8

Prescription 1. If total Ferinject® Treatment requires splitting over two treatment dates, 7-days apart, use prescription 1 & 2 (overleaf)										
Date	Drug	Dose	Infusion fluid	Rate	Batch Number	Given by:	Checked by:	Pharmacy use only		
	Ferric Carboxymaltose (Ferinject®)		Sodium Chloride 0.9% 250ml					Clinical check	Dispensed	Checked

Prescriber PRINT name and signature		Bleep no		Date	

Prescription Chart 2 Intravenous Iron Infusion Ferric Carboxymaltose (Ferinject®).

Prescription 2 Only use if total Ferinject® dose exceeds 20mg/kg in a 7-day period and total dose requires splitting over two treatment dates.										
Date	Drug	Dose	Infusion fluid	Rate	Batch Number	Given by:	Checked by:	Pharmacy use only		
	Ferric Carboxymaltose (Ferinject®)		Sodium Chloride 0.9% 250ml					Clinical check	Dispensed	Checked

Prescriber PRINT name and signature		Bleep no		Date	

- **Each 2ml Ferinject® vial contains 100mg of Iron as ferric carboxymaltose**
- **Each 10ml Ferinject® vial contains 500mg of Iron as ferric carboxymaltose**
- **Each 20ml Ferinject® vial contains 1000mg of Iron as ferric carboxymaltose**
- **Do not dilute to concentrations less than 2mg of Iron per ml.**

When required medicines					
Adrenaline 1 in 1000 **500 micrograms (0.5ml)** IM STAT Sign Date	Date & Time				
	Sign				
Hydrocortisone 100mg (Max 500mg in 24 hours) IM or slow IV Sign Date	Date & Time				
	Sign				
Paracetamol 1g oral **every 4-6 hours** (Max 4g in 24 hours) **If <50kg 500mg QDS is the maximum daily dose** Sign Date	Date & Time				
	Sign				
Chlorphenamine 10mg IV (Max 40mg in 24 hours) Sign Date	Date & Time				
	Sign				

East of England Neonatal ODN
(Hosted by Cambridge University Hospitals)

Clinical Guideline: The routine supplementation of vitamins and iron and the management of zinc deficiency in preterm and small for gestational age infants

Authors: ODN's Dietetic Group (NatNeoRD) and Affiliates.

[Adapted for the the EoE by [redacted], Lead Dietitian for the EOE ODN]

For use in: EoE Neonatal Units, Guidance specific to the care of neonatal patients.

Used by: Neonatal Pharmacists, neonatal dietitians, neonatal nursing staff and medics.

Key Words: preterm infant, iron, vitamins, zinc, supplementation.

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Approved by:

Neonatal Clinical Oversight Group	
Clinical Lead [redacted]	[redacted]

Ratified by ODN Board:

Date of meeting	

Audit Standards:

100% infants who meet the criteria for vitamin supplementation receive appropriate and timely supplements in line with the recommendations laid out in this guidance.

100% infants who meet the criteria for iron supplementation receive appropriate and timely supplements in line with the recommendations laid out in this guidance.

Contents

1.0 Routine supplementation

1.1 Vitamin supplementation in preterm and small for gestational age infants.

1.1.1 Introduction

Both fat- and water-soluble vitamins are essential nutrients for whole body function and homeostasis. Water-soluble vitamins are not stored in the body, so need to be provided continuously through dietary provision, whereas fat-soluble vitamins are stored in fatty tissue and the liver.

The third trimester of pregnancy is a period of rapid nutrient accretion and the time when fat-soluble vitamin stores are laid down. Premature birth interrupts this process, consequently preterm infants have lower stores of fat-soluble vitamins and potentially higher requirements for all vitamins than those born at term.

Although there is some limited evidence for a few key vitamins available from supplementation studies aimed at improving clinical outcomes, an overall lack of studies makes it difficult either to describe the metabolism of vitamins in preterm infants or to determine their vitamin requirements.

Current guidelines for preterm nutritional requirements (1, 2) recognise this lack of evidence and therefore base their recommendations for vitamin intakes on several factors:

- The vitamin dosages used from supplementation studies in preterm infants that demonstrated improvement in clinical outcomes.
- The recommendations of the European Food Safety Authority (EFSA) for term infants (<6 months). Theoretically, the EFSA daily recommendations may underestimate the increased requirements of the rapidly growing preterm infant. However, because of the weight difference between term and preterm infants the authors of these publications considered that daily, per kilogram, recommendations for term infants are likely to be adequate for preterm infants as they represent approximately a 3- to 5-fold higher intake per kilogram body weight per day.
- The EFSA best estimate of the vitamin content of mature mother's own milk, when fed at minimal recommended energy intake for a preterm infant of 115Kcal/Kg/day.
- The vitamin content of commercial preterm formulas when fed at a volume that provides 115Kcal/kg/day.

1.1.2 Scope & evidence

The recommendations in this document have been formulated through clinical consensus. They are based upon a thorough literature search, which includes 3 international publications (1-3) and a detailed quantitative analysis of milk, fortifier and vitamin formulations by gestation and weight, undertaken by the authors (4-12).

The dosing algorithm proposed for the East of England ODN is a pragmatic, single dosing approach that reflects current network practice, which to date has provided a simple to implement strategy with no evidence of harm.

It also ensures that baseline ESPGHAN requirements are met. In some smaller infants with a birth weight around 500g, this regimen will provide more than the ESPGHAN recommended daily vitamin A & D intakes (1) (see table 2 in Appendix 4) however the number of infants who will be in receipt of vitamin doses higher than ESPGHAN recommendations will be insufficient to justify a significant change in practice.

Some argue that concerns about potential vitamin A toxicity have led to caution in dosing regimens in preterm infants, however these arguments are largely unfounded (13). In one dose comparison study, intramuscular regimens of up to 8500 units/kg/day were administered and potential adverse effects were seen in less than 5% (14). ESPGHAN (1) currently acknowledge that there is insufficient data to change the existing recommendation for vitamin A in preterm infants.

This guideline is to be used as an adjunct to clinical decision making. Where infants are receiving volumes of milk considered outside the “normal” range of 150 -165 ml/kg/day advice should be sought from a suitably experienced neonatal dietitian.

1.1.3 Supply & alternatives

A limited range of suitable multivitamin preparations are available for use in the preterm population (Appendix 2). It is widely recognised that intermittent supply issues of first line vitamin preparations bring difficulties in provision to infants. A table of alternative multivitamin products suitable for use during these periods, or where a need for peanut and soya avoidance is required, can be found in Appendix 3.

DaliVit® is not recommended as a first line preparation as it has a much higher vitamin A content than other preparations. It is not a directly interchangeable product with others on the market (see Appendix 2)

1.1 4 Preterm vitamin requirements

Recommended enteral intakes for vitamins (ESPGHAN) (1)

	ESPGHAN (2022)
Thiamine (B1) (micrograms/kg/day)	140-290
Pantothenic acid (mg/kg/day)	0.6-2.2
Biotin (micrograms/kg/day)	3.5-15
Niacin (micrograms/kg/day)	1100-5700
Ascorbic acid (vitamin C) (mg/kg/day)	17-43
Riboflavin (B2) (micrograms/kg/day)	200-430
Pyridoxine (micrograms/kg/day)	70-290
Folic acid (micrograms/kg/day)	23-100
Cobalamin (B12) (micrograms/kg/day)	0.1-0.6
Vitamin A (units/kg/day)	1333-3300 (400-1000micrograms retinol ester/kg/d)
Vitamin D (units/kg/day)	400-700 IU/kg/day (<1000)
Vitamin E (mg/kg/day)	2.2 – 11
Vitamin K (micrograms/kg/day)	4.4 – 28

1.1.5 Who should receive vitamin supplementation?

The gestation below which additional vitamins are required is unclear, consequently supplementation practice has, in the past, varied across the UK.

Current guidelines provide recommendations for vitamin intakes in extremely low birth weight (ELBW) and very low birth weight (VLBW) infants (2) and for infants <1800g (1) but neither make any delineation by degree of prematurity.

The vitamin requirements of late and moderate preterm (LMPT) infants, defined as infants born 32+0 – 33+6 weeks gestation (moderate preterm) and 34+0 – 36+6 weeks gestation (late preterm), are likely to be higher than those for term infants, but again, there are insufficient data to inform intake levels for any except for vitamin D. Current recommendations are to provide all LMPT infants with a vitamin D supplement from birth and throughout early childhood (15 ,16).

Due to the lack of detailed guidance, a pragmatic approach needs to be taken as to the population this guideline applies to, however, available evidence would suggest some vitamin supplementation is required for all infants born <37 weeks gestation, and for all infants <37 weeks who are exclusively fed human milk to receive further vitamin K supplementation for at least the first 3 months post discharge. (36)

Single Dosing, Pragmatic Dosing Approach

All infants born <34 weeks and/or any infant born <1.8kg from 100mL/kg enteral feed	
Fortified Human milk (SMA or Nutriprem HMF) Nutriprem 1® Hydrolysed Nutriprem 1 ® or SMA Gold Prem 1®	Abidec® 0.6mL/day
Unfortified Human milk*	Folic Acid 50microgrammes/day (to term due date) **and** Abidec® 0.6 mL/day **and** Colecalciferol 300 units/day (NOT per kg)
On reaching 2.0kg or discharge	
Fortified Human milk, SMA Gold Prem or Nutriprem (including fortifier supplements at home). SMA Gold Prem 2® or Nutriprem 2® Term/specialist formula	Abidec® 0.6mL/day
Exclusive breastfeeding or where unfortified human milk provides more than 50% of total feed volume	Abidec® 0.6 mL/day At discharge: Stop Colecalciferol Consider 50 microgrammes/day vitamin K Continue folic acid to term
Any infant born 34-36+6 weeks and >1.8kg from 100ml/kg enteral feed	
Human milk or term /specialist formula	Abidec® 0.6 mL/day
On discharge	
Term /specialist formula	Abidec® 0.6 mL/day
Exclusive breastfeeding	Abidec 0.6mL/day Consider 50 microgrammes/day vitamin K

* ESPGHAN supports the routine use of breast/human milk in infants born <1.8Kg.

Without breast milk fortifier full nutritional requirements for electrolytes, vitamins, calcium, phosphate, other minerals and trace elements will not be met.

Consider continuing prescribed supplements to at least 6 months corrected (up to maximum of 1 year actual age), at which point national public health policy on childhood vitamin supplementation should be employed (43, 44).

Consider measuring serum 25-hydroxy vitamin D at 3-4 weeks of life and then every month until discharge (1).

1.2 Iron supplementation in preterm and small for gestational age infants

1.2.1 Introduction

Iron is an essential micro mineral, which is required for haem synthesis, oxygen transport, enzyme functions and brain development (2).

Preterm and low birth weight infants are at risk of deficiency due to low stores at birth, higher requirements secondary to rapid growth, losses caused by frequent blood sampling and the requirement for parenteral nutrition support for the smallest and sickest infants, which does not routinely contain iron (2). Freshly expressed human milk is recognised as the optimal feed for preterm infants (3). However, human milk does not meet the elevated iron requirements of preterm infants.

Iron deficiency anaemia should be avoided as it may adversely affect brain development (2). Excessive intakes of iron can also be detrimental to preterm infants and should be avoided, as there is no mechanism for excretion. Excess iron may increase oxidative stress and associated complications of prematurity (2).

Current guidelines for preterm nutritional requirements (1, 2) recommend intakes of iron that will not be met by human milk, nor by some commercial feeds used when human milk is unavailable. Iron supplementation is therefore recommended (1, 3). The iron supplement used in the United Kingdom is sodium feredetate 27.5mg of iron per 5mL oral solution. The guidance in this document is based on this formulation.

1.2.2 Scope & evidence

These recommendations have been formulated through clinical consensus. They are based upon a thorough literature search, which includes 3 international publications (1-3) and a detailed quantitative analysis of milk, fortifier and iron supplement by gestation and weight, undertaken by the authors (4-12, 45).

A pragmatic approach has been taken to ensure that baseline requirements, as detailed by the European Society for Paediatric Gastroenterology Hepatology and Nutrition (ESPGHAN) (1) are met, and that where intakes higher than the upper range are suggested, they do not exceed levels which could be considered harmful (e.g. toxicity).

This guideline is to be used as an adjunct to clinical decision making. Where infants are receiving volumes of milk considered outside the “normal” range of 150 -165 mL/kg/day advice should be sought from a suitably experienced neonatal dietitian.

1.2.3 Preterm and small for gestational age infant requirements

Current guidelines provide recommendations for iron intakes for any infants <1800g, preterm infants born at <1500g, 1500-2000g, 2000-2500g, <2500g, (1,15) and term infants born below 2.5kg (3). These guidelines vary in their recommendations for both iron dosing and for when to commence supplementation, with some proposing a staggered approach.

To meet these requirements exactly, using sodium feredetate (27.5 mg of iron per 5mL oral solution) a supplementation strategy would involve multiple different doses based on gestation and weight.

The author group felt recommending a strategy that required multiple doses and different ages at which supplementation commenced would lead to reduced compliance, so a pragmatic approach to both dosing and timing has been taken in the construction of the recommendations.

In line with most recent guidelines, the group recommend that iron supplementation commences from 2 weeks' postnatal age.

The dose of iron given in combination feeding regimens should be informed by the predominant feed (that is the feed which comprises over 50% of intake).

The guidelines recommend iron supplementation continues until adequate iron intake from solids can be proven, however there is inadequate neonatal dietetic resource nationally to provide the individual assessment required to support this. In order to minimise the risk of anaemia in the ELBW and VLBW infants, the group recommend continuing iron supplementation to at least 6 months chronological age at 12 months actual/chronological age (or earlier if shown by dietetic assessment that iron requirement is being met from dietary sources). Clinical judgement should be employed where there is developmental delay or feeding difficulties.

A summary of guidance from the international guidelines and studies (1,2,15,3) focusing on iron supplementation is detailed the table below:

Guideline	Weight	**Amount** (expressed as elemental iron)	Start	End
ESPGHAN 2022 (1)	<1800g ≥1800g	2-3 mg/kg Not specified	2 weeks Not specified	6-12 months Not specified
Koletzko 2021 (2)	<1500g 1500 - 2000g 2000 - 2500g	2-3 mg/kg 2 mg/kg 1-2 mg/kg	2 weeks 2-4 weeks 4-6 weeks	6-12 months 6-12 months 6 months
BAPM 2023 – Late to moderate preterm infants (15)	<2000g >2500g	2-3 mg/kg 1-2 mg/kg	Not specified	At least 6 months
WHO 2022 – term infants (3)	<2500g	2-4 mg/kg	When enteral feeds are well established	Until baby receives iron from another source

1.2.4 Recommendations for iron supplementation

All infants born <34 weeks and/or any infant born <1.8kg from 2 weeks of age			
Feed type	Working weight (kg)	Sodium feredetate (27.5mg/5mL) dose (mL/day)	Ferrous Fumarate* (45mg/5mL) dose (mL/day)
Unfortified human milk or human milk fortified with **Nutriprem** Breast Milk Fortifier®	<1.5 ≥ 1.5	0.5ml/day 1.0ml/day	0.3mL/day 0.6mL/day
Standard, specialist or high calorie formula designed for term infants	≥ 1.0	0.5mL/day	0.3mL/day

The following feeds do not require iron supplementation for this cohort of infants:

Nutriprem 1® Hydrolysed Nutriprem 1® Nutriprem 2® SMA Gold Prem 1® SMA Gold Prem 2® human milk with SMA Gold Prem Breast Milk Fortifier®

Continue supplementation until 12 months actual age.

Clinical judgement should be exercised when discontinuing iron supplementation. Some infants, especially those born <2Kg, may require supplementation beyond this timeframe.

Infants born 34-36.6 weeks or >37 weeks with a birthweight 1.8kg - 2.5kg from 2 weeks of age		
Feed type	Sodium feredetate (27.5mg/5mL) dose (mL/day)	Ferrous Fumarate* (45mg/5mL) dose (mL/day)
Exclusive breastfeeding or where human milk provides more than 50% of total feed volume	0.5 mL/day	0.3mL/day

The following feeds do not require iron supplementation for this cohort of infants:

Standard, specialist or calorie dense formulas designed for term infants

Consider continuing supplementation until 6 months actual age (or earlier if dietetic assessment shows requirements are met from dietary sources)

***** The Galfer® brand of ferrous fumarate has dosing recommendations for preterm neonates from 4 weeks of age. If using other ferrous fumarate products, assess the excipient content prior to use.

1.2.5 Monitoring supplementation

Ferritin is an acute phase protein and is used as a marker of iron status, with serum concentrations < 35-40 micrograms/L indicating deficiency and >300-350 micrograms/L signifying iron overload (1). Where inflammation or infection are evident, serum ferritin should not be used as a reliable marker as it will be elevated (1). Serum ferritin is also not a reliable marker where liver disease is present (1). It is recognised that the individual iron status of ELBW and VLBW infants will vary, subsequently repeated measurements of ferritin are recommended (1). Increasing iron dose to 3-4 mg/kg/day (in some cases 6 mg/kg/day) should be considered if ferritin < 35-70 micrograms/L, but an intake of >3 mg/kg/day for more than a few weeks should be avoided due to risk of adverse effects (1). Infants receiving erythropoietin treatment may require higher doses of iron, up to 6 mg/kg/day (1). If ferritin is > 300 micrograms/L iron supplementation should be stopped (1), For infants receiving human milk fortified with SMA Gold Prem 1 Breast milk fortifier® (a source of iron), this should be replaced with Nutriprem Breast Milk Fortifier® (which is not fortified with iron) until serum ferritin falls below this level.

1.2.6 Iron supplementation and blood transfusion

1.2.6.1 Iron supplementation following blood transfusion

There is currently limited guidance on whether iron supplementation should be withheld post blood transfusion. This is due to limited research conducted in this area. Iron supplementation should be withheld following blood transfusions in preterm babies where ferritin levels are >300 micrograms/L or for babies with haemolytic disorders as these may predispose the infant to iron overload. In cases where babies are transfused for the anaemia of phlebotomy losses or external haemorrhage, it may be appropriate to continue iron supplementation (3, 46).

1.2.6.2 Enteral feeding and transfusions

There is currently insufficient evidence from randomised controlled trials to guide whether feeds should be stopped during transfusion (47). Some studies suggest that feeding during transfusion increases morbidity and mortality (48), whilst others show no difference with or without feeds during transfusion (49).

The WHEAT trial (Withholding Enteral feeds Around packed red cell Transfusion) is an ongoing multi-centre randomised point of care trial aiming to find out whether withholding milk feeds before, during, and after blood transfusion in preterm infants reduces the risk of necrotising enterocolitis versus whether pausing feeds for 12 hours with each blood transfusion may have adverse effects in itself (50).

1.2.7 Considerations when administering iron supplements

In general, it is advised to give iron supplements on an empty stomach, and apart from food, to maximise absorption of iron. However, there is a historical consensus that the osmolality of enteral feeds should not exceed 450 mOsm/kg (58). The physiological response to hyperosmolar solutions is delayed gastric emptying (58). Sodium Feredetate is known to have a high osmolar load, so it may be prudent to dilute iron supplements in milk feeds prior to administration (58). Srinivasan et al. (2009) recommend every 0.1 mL of Sodium Feredetate needs a milk volume of 1.2 mL (59). Some centres choose to give the iron supplement just before a milk feed to ensure the full dose is taken and ensure the iron supplement is mixed with feed to maximise tolerance.

2.0 Management of zinc deficiency in preterm and small for gestational age infants

2.1 Introduction

Zinc is an essential trace element, meaning the body is unable to make or store it, requiring continuous dietary intake. Zinc is accrued during the third trimester of pregnancy. It is one of the most prevalent trace elements in the brain and contributes to its structure and function (60). It has an important role in gene transcription, immune defence (61), and growth due to its central role in the production of enzymes integral to the production of DNA and RNA (60) and tissue differentiation (2).

Preterm infants not only have lower reserves and reduced absorption of zinc but will have increased requirements during the postnatal period of rapid growth (63 64). Zinc deficiency is associated with poor growth, increased risk of infection, skin rash and possible poor neurodevelopment (2). Risk factors for poor zinc status include insufficient zinc intake either via parenteral or enteral routes, breastmilk with low zinc levels due to inadequate maternal zinc transfer, and excess gastrointestinal losses due to high enterostomy losses >20 mL/kg/day or persistent diarrhoea (1, 2). Genetic defects in zinc transporters located in the mammary gland can lead to breastmilk containing no zinc leading to cases of acrodermatitis enteropathica in the neonatal period secondary to zinc deficiency (64 66). Zinc excretion is also affected by renal immaturity (64), and concomitant use of certain medications such as diuretics and steroids.

Zinc does not have a pro-oxidant effect, and adverse effects of excess zinc intakes are rarely reported, although copper absorption may be impacted with high zinc intakes over a long period time i.e., >3 months (2).

2.2 Scope & evidence

These recommendations have been formulated through clinical consensus. They are based upon a thorough literature search, which includes international publications (1,2).

2.3 Preterm and small for gestational age infant requirements

Current guidelines recommend an enteral zinc intake of 2-3 mg/kg/day for preterm infants <1.8 kg (1, 2). There are no specific recommendations for small for gestational age or late to moderate preterm infants. However, there are recommended nutrient intakes for zinc for infants and children in general, which would include late preterm infants and small for gestational age infants (62).

Recommended nutrient intakes (RNI) for zinc have been established (Table 1). It should be noted the RNI should not be used to treat deficient states, as therapeutic supplementation will be required for a short period of time to treat a deficiency.

Guideline	Age range/weight	Recommended intake (Parenteral RNI)	Recommended intake (Enteral RNI)
ESPGHAN 2022 (1)	<1.8kg	400-500 micrograms/kg/day	2-3 mg/kg/day
Koletzko 2021 (2)	<1.8kg	400-500 micrograms/kg/day	2-3 mg/kg/day
Department of Health 1991 (50)	0-6 months post term		4 mg/day
Department of Health 1991 (50)	7-12 months post term		5 mg/day
ESPGHAN 2018 (53)	0-6 months post term	250 micrograms/kg/day	
ESPGHAN 2018 (53)	7-12 months post term	100 micrograms/kg/day	

Table 1: Recommended nutrient intake (RNI) for zinc in nutrition support

2.4 Optimising zinc intakes and treating deficiency

Zinc is an essential element for weight gain and linear growth. There are several contributing factors associated with low zinc levels, including enterostomy losses and use of certain medications (Table 2).

Zinc deficiency can be prevented by ensuring sufficient zinc is provided in nutrition support (parenteral nutrition and enteral) to meet recommended nutrient intakes. This is especially important where there is a high protein intake as more zinc will be required to support linear growth and muscle mass accretion (64).The NDIG working group and others (61 65) found

no evidence to support routine zinc supplementation over and above the recommended nutrient intake. Cases of zinc toxicity are rare but excessive prolonged zinc supplementation over months can also lead to copper and iron deficiency (62).

	Causes of abnormal biochemistry	action
PN >21 days	Limitation of zinc in PN	Where able, increase enteral intake to full fortified human milk
Unfortified human milk	Human milk does not contain adequate zinc	Infants <1.8kg at birth need fully fortified human milk or preterm formula
Enterostomy losses	High small bowel ostomy losses ≥20 mL/kg/day is associated with increased zinc losses	Review factors associated with ostomy losses, aim to control output ≤20 mL/kg/day
Systemic glucocorticoids	Reduce gut absorption of minerals including zinc which is essential for bone growth	Monitor growth and check zinc levels as per guideline
Proton Pump Inhibitors	Reduced gut absorption of zinc (neutralisation of stomach acid)	Refer to local reflux management guidelines
Diuretics	Increased urinary zinc losses	Encourage regular review of ongoing diuretic use and ensure lowest effective dose is used.

Table 2: Contributory factors in zinc insufficiency and recommended actions

2.5 Recommendations for Zinc Screening

ESPGHAN recommend serum zinc levels should be measured in infants on long term parenteral nutrition after 21 days and in the absence of any ongoing inflammatory response (such as NEC or sepsis). Serum zinc should be measured in infants with low alkaline phosphatase (ALP), poor linear growth or high ostomy or gastrointestinal losses to identify zinc deficiency and need for supplementation (1, 2).

Zinc levels should therefore be measured on or around day 21 of life in all babies with the following zinc deficiency risk factors:

- On PN at day 21 of life
- <1000g or <28 weeks at birth
- Acrodermatitis enteropathica
- Poor growth (length)
- ALP level below local reference range (or ≤61 units/L)
- Persistent GI fluid losses following enterostomy >20 mL/kg/day

Please note:

1. Check with local laboratory for unit-specific recommendations and blood tube guidance. **Note** the tube must *not* have an orange/ black rubber ring in the top (this contains zinc and will affect the accuracy of the reading).
2. When completing a serum zinc measurement, it is important that routine bloods of liver function tests (LFTs) and C-reactive protein are completed at the same time.
3. CRP levels reflect an acute inflammatory response. Serum zinc levels may be falsely low if CRP >10 mg/L.
4. Serum zinc measurements should therefore only be done when CRP <10 mg/L.

2.6 Recommendations for zinc management in cases of deficiency

Step One: Assess

If zinc levels <11.2 micromol/ L (or below local laboratory reference range) with a CRP <10 mg/L, zinc supplementation should be commenced at a dose of 2 mg/kg/day of elemental zinc for 4 weeks.

Step Two: Review

After 4 weeks do growth, skin or biochemical abnormalities still persist?

Yes

Step Three

Recheck zinc levels and continue zinc supplementation at 2mg/kg/day of elemental zinc for a further 4 weeks (total 8 weeks)

No

Step Three

Stop zinc supplementation and aim to provide age appropriate RNI for zinc

Step Four (Redress imbalances)

1. During this time ensure there is adequate nutritional intake (Table 1). Optimise enteral nutrition intake of zinc via fortified breastmilk and routine vitamin/ mineral supplement or age-appropriate alternative preterm infant formula in line with RNI.
2. Review medication and possible contributory factors as able (Table 2)

Things to consider:

- Low serum zinc levels (with normal CRP) will not be redressed through enteral feeds alone and zinc supplementation will be required for a restricted, supervised period of 4-8 weeks maximum.
- For infants with ileostomies, supplements should only be started once full feeds have been established, other electrolyte supplements have been commenced and tolerated.
- Zinc, iron, and copper compete for the same site of absorption, so when provided as individual mineral supplements, they should be administered at differing time points (51).
- Zinc has a low toxicity, but prolonged high dose supplementation will impair copper bioavailability
- Available zinc products/formulations: Solvazinc. Dilute 1 tablet (45mg elemental zinc) with 8.5mL water (noting 0.5mL displacement) to prepare a 5 mg elemental zinc/mL solution for administration (alternative dilutions can also be used – discuss with pharmacy).

2.7 Formulations of Zinc and dosage

There are three brands listed in the British National Formulary for Children (BNFc). These are Solvazinc®, AadZinc® and Aactizinc®. Dosing in this guideline is based on Solvazinc® (67). The BNFc specifically states that 125 mg of zinc sulfate monohydrate is equivalent to 45 mg of elemental zinc in Solvazinc®. This product has gone through the licensing process and is a recognised “Pharmacy Only Medicine” (68). See “Things to consider” box on previous page for dilution information .

The group suggest a dose of 2 mg/kg/day for preterm babies (69, 70). This is higher than the BNFc dosage of 1mg/kg/day which just refers to neonates. Preterm babies will not have the stores of zinc that term babies are born with and have higher urinary losses (64). Therefore, if deficient, they will most likely need more zinc to correct this deficiency.

3.0 Supplementary Information

3.1 Using licensed medicines, unlicensed medicines and food supplements

Wherever possible, licensed medications should be used for treating patients. These medicines will have a product license (PL) number on the packaging indicating they undergone full evaluation by the MHRA (71).
Unlicensed medicines don’t have a UK Marketing authorisation but meet the definition of a medicine in that they have properties for treating or preventing disease or are used for correcting, restoring or modifying a physiological, metabolic or immunological function. Pharmacists and prescribers must assure themselves of the quality, safety and efficacy of the unlicensed medicine they want to use (72).
Food supplements are defined as “a concentrated source of a vitamin or mineral or other substance with a nutritional or physiological effect, alone or in combination and is sold in dose form.” (73). Food supplements are made to different quality standards to medicines and are not evaluated by the MHRA. It is not possible to gain additional assurances from the manufacturers of food supplements.
Within this guidance there is reference to products that are considered to be food supplements such as certain brands of zinc, iron and phytomenadione. Where possible a licensed medication should be selected over a food supplement and a risk assessment should be completed if a food supplement is used over a licensed product.

Excipients
When choosing a product to use in children, do consider the products excipients. For further information see https://nppg.org.uk/choosing-an-oral-liquid-for-a-child/ which contains information on assessing excipient content.

3.2 Appendix 1

Evidence to Support Vitamin Recommendations

Water Soluble Vitamins (including Folic Acid)

Water soluble vitamins are essential nutrients for whole body function and homeostasis. For most of the water-soluble vitamins there are very few data to provide evidence-based dietary recommendations for preterm infants. In the absence of robust evidence, recommendations are often inflated to ensure adequacy is well in excess. Current recommendations for water soluble vitamins predominantly reflect the amounts added from industry in preterm infant formulas. It is recommended to monitor nutrient status of preterm infants fed unfortified human breastmilk. Intakes above dietary recommendations are unlikely to be of benefit in improving patient outcomes (2).

Folate is essential to form normal red blood cells and certain amino acids. In one study folate intake has a positive association with weight and length gain in extreme preterm infants. (15) Plasma folate is lower in infants receiving only human breast milk rather than fortified human milk or preterm infant formula. Studies in infants receiving preterm formula or breast milk fortifiers have shown no evidence of folate deficiency, as indicated by serum concentrations or haematological profile results (16), or raised levels of homocysteine (17), a biomarker of folate deficiency, hence suggesting they all had adequate intake. Milk formulas and breast milk fortifiers usually contain much higher amounts of folate than is present in breast milk. Folic acid is not present in standard vitamin supplements (eg Abidec/Dalivit) so needs to be supplemented separately.

Fat Soluble Vitamins

Vitamin D

Vitamin D, a fat-soluble vitamin, is essential for the absorption of calcium and phosphorus and is therefore vital in bone formation. Supplementation is of no benefit to bone health if there are inadequate supplies of these two minerals, though its exact mechanism is unknown. Further study is needed to identify preterm vitamin D physiology and the status required to be most protective of bone and extra skeletal development (2).

Vitamin D is primarily transferred to the fetus in the third trimester of pregnancy and is also impacted by the mother's vitamin D status (2). Consequently, many preterm infants have low vitamin D levels at birth (18,19). There is no consensus regarding the definition of vitamin D deficiency in infants. ESPGHAN guidance pragmatically suggest that a serum 25-hydroxy vitamin D concentration >50 nmol/L be used to indicate sufficiency, but that concentrations > 120nmol/L be avoided (1).

There are few adequately powered controlled trials on which to base firm recommendations for dosing and duration of vitamin D supplementation in preterm infants. ESPGHAN identified studies with dosage ranges of 200-300 units/kg/day to 400-670 units/kg/day that

sufficiently reduced vitamin D deficiency and suggest a dosing regimen of 400-700 units/kg/day (maximum dose of 1000 units/day) (1).

Several studies have also investigated the safety of vitamin D supplementation. They have identified toxicity in some, particularly very low birthweight infants, on a variety of standard dosing regimens (not calculated per kg bodyweight) and which were implemented without regular blood monitoring of vitamin D status (20 - 22). Supplementation with excess active vitamin D may cause calcium resorption of the bone and renal disease (e.g. nephrocalcinosis) and should only be considered where there is clear biochemical deficiency or poor absorption (e.g. significant cholestatic liver disease). ESPGHAN (1) recommends measuring serum 25-hydroxy vitamin D at 3-4 weeks of life and then every month until discharge for all preterm infants.

Vitamin A

Vitamin A is a fat-soluble vitamin that is essential for growth, body regulation and differentiation of cells, including the retina of the eye and lung maturation. Preterm infants are born with low plasma concentrations of retinol and retinol binding protein (RBP) (23). They are also susceptible to vitamin A deficiency due to low transplacental transport, poor enteral nutrition post birth and reduced gastrointestinal absorption (24).

A Cochrane review showed that additional vitamin A supplementation in premature infants may reduce the risk of mortality and chronic lung disease as well as lower the incidence of retinopathy of prematurity (25). However, those studies investigated intramuscular injections and their effect on bronchopulmonary dysplasia (BPD) and have been found to be painful, therefore it is not common practice. There is contradictory evidence of the beneficial effects of enteral vitamin A supplementation.

Recommended daily intake of vitamin A for premature infants on the neonatal unit is 400-1100 micrograms retinol ester/kg/day or 1330-3300 units/kg/day. However, according to the most recent ESPGHAN guidelines (2022), a higher vitamin A intake may be required for those infants with hepatic impairment, and lower intake for those with renal impairment (1).

Vitamin K

Vitamin K is a group of lipophilic, hydrophobic vitamins necessary for the synthesis of coagulation factors (factors II (prothrombin), VII, IX, and X, and the anticoagulation proteins C and S in the liver, as well as many other important functional proteins such as osteocalcin. Insufficient levels of vitamin K may lead to haematological complications, resulting in the impaired production of these active coagulation molecules (26 27) and a subsequent increased risk of vitamin K deficiency bleeding (VKDB), which may be devastating.
Vitamin K deficiency is far more common in neonates compared to adults due to immaturity of the coagulation system, inadequate colonisation with Vitamin K-producing bacteria in the intestines, limited maternal transfer of vitamin K across the placenta, and low concentrations of the vitamin in breast milk.(28) Exclusive human milk feeding is a risk factor for VKDB in otherwise-healthy preterm and term infants,(26 29 30 31) with a significant proportion of term infants showing evidence of subclinical Vitamin K deficiency at age 2-5 months related to breastfeeding duration (32 33 34)

All preterm infants are offered prophylactic Vitamin K at birth, and those exclusively fed human milk receive sufficient extra Vitamin K from multinutrient milk fortifiers if given during the NICU stay, However , a preterm infant on full exclusive unfortified breastmilk feeds (150 mL/kg/day) receives only a minimal proportion of their currently recommended Vitamin K intake of 4.4-28 micrograms/kg/day (1). A recent prospective observational study in exclusively-breastfed preterm infants who all received intramuscular prophylaxis at birth showed that some already had undetectable Vitamin K levels prior to discharge, and that the majority who remained exclusively breastfed post-discharge had developed biochemical evidence of functional subclinical Vitamin K deficiency by 2-3 months corrected age for both haematological and bone Vitamin K-dependant proteins.(35)

Nutritional guidelines for preterm infants do not offer recommendations for Vitamin K supplementation after discharge, however more recent publications suggest consideration should be given to the provision of a daily supplement of 50 micrograms/day for all preterm infants born <37 weeks gestation being discharged exclusively on unfortified human milk feeds. Where the decision is made offer this supplement, it should be taken for at least the first 3 months at home in order to improve intakes in early infancy and guard against subsequent deficiency.

Current multivitamin preparations used for preterm infants do not contain vitamin K, though there are a range of acceptable options for supplementation that can be implemented in line with unit preference and IntegratedCare Board product availability.(36) Options that would effectively deliver the equivalent of at least the minimum daily requirement of 50 micrograms could include:

i) Konakion MM Paediatric® (phytomenadione 2mg in 0.2 mL; Neon Healthcare Ltd), 2 mg **given orally** once monthly

ii) A single further Konakion MM Paediatric® 1mg intramuscular injection at discharge - this should protect for up to 3 months and would avoid compliance issues but may be far less acceptable to parents and babies.(36)

iii) NeoKay oral drops® (Neoceuticals Ltd; 200 micrograms/mL VK_1) dose 50 micrograms(0.25 mL via dropper) once daily to provide daily VK_1 intake comparable to that from formula milks which are supplemented to meet current recommendations (VK_1 content typically 60-80 micrograms/L); 1 bottle at the recommended dose will last 3 months. This product is a food supplement.

Vitamin E

Vitamin E encompasses a group of biologically active tocopherols (1) This nutrient functions as an important antioxidant supporting the prevention of haemolytic anaemia, BPD and retinopathy of prematurity (ROP) (37). In addition, it may play a role in stimulating immunity (38) and protecting against intraventricular haemorrhage (IVH) however there is evidence that it may also increase the risk of sepsis. (39) Low circulating levels of vitamin E are noted in preterm infants at birth (40). Milk from mothers who delivered preterm however can contain a higher vitamin E content as does preterm formula in comparison to term formula. Studies of routine enteral vitamin E supplementation in this group suggest maintaining

plasma vitamin E concentrations of 10–35 mg/L (Minimum dose of 3.8 mg/kg/d) (1). No clinical benefits have been seen however, and the recommended daily intake of vitamin E in preterm infants is 2.2–11mg/kg/d. Additional higher supplementation should be considered for infants with cholestasis.

Evidence to Support Iron Recommendations

Iron supplementation versus no supplementation

A systematic review of 8 trials, conducted in 7 countries and including 1093 infants (birth weight <1.5kg and <32 weeks' gestation), was conducted by the World Health Organization to examine the impact of iron supplementation on morbidity, growth, neurodevelopment and anaemia (3). Most trials involved comparing supplementation of 1-7mg/kg/day iron with a placebo or no iron supplementation (3). One trial compared a multivitamin and iron preparation with multivitamins alone (3). Iron supplementation was reported to have little or no effect on sepsis, necrotising enterocolitis, cognitive development or feed intolerance (very low certainty evidence) (3). It was associated with increased weight (very low certainty evidence) and length (moderate certainty evidence) (3). Iron supplementation was found to decrease prevalence of anaemia and increased haemoglobin (moderate certainty evidence) (3).

Low birth weight infants

There is evidence to show that babies with birth weights of 2000-2500g (regardless of gestation) who are given iron supplements (1-2 mg/kg/day) from 6 weeks to 6 months of age have a decreased risk of iron deficiency (36% vs 4%) and iron deficiency anaemia (10% vs 0%) at 6 months (49). In addition, the risk of iron deficiency at 12 months of age is also reduced (44). The follow up to this randomised controlled trial (RCT) showed that at 3 ½ years of age, those supplemented with iron had a significantly lower prevalence of behavioural problems than those in the placebo group (3% vs 13%) (50) and they had significantly lower scores in aggressive and rule-breaking (externalising-type) behaviours and in thought problems at 7 years of age (51). It is recommended to give iron supplements to babies with birth weights of 2000-2500g regardless of gestational age, at a dose of 1–2 mg/kg/day up to 6 months of age (2).

Starting iron supplementation

ESPGHAN updated their recommendation to start iron supplementation at 2 weeks of age, compared with their previous advice of starting at 2-4 weeks, following a meta-analysis conducted by Jin et al (52). This found starting iron supplementation at ~2-3 weeks vs later ~4-8 weeks of age is associated with less of a decrease in serum ferritin and haemoglobin levels and consequently a lower need for blood transfusions in preterm

babies. Koletzko et al (2) also recommend initiation of iron at 2 weeks, following findings of improved haematological parameters with early initiation in babies born <1300g (53).

Discontinuing iron supplementation

ESPGHAN recommended that iron supplements are continued in preterm infants until 6–12 months of age (depending on diet) and that haemoglobin and serum ferritin should be monitored at follow-up visits (1).
Preterm and term infant should receive iron rich complementary foods (1, 54). It is acknowledged iron fortified foods and iron supplements may be needed to meet requirements during the introduction of complementary foods (54). The source of dietary iron will impact on absorption with approximately 25% of animal or haem sources of iron absorbed (54). Non haem sources of iron are less well absorbed, and absorption is affected by other dietary factors which can facilitated and inhibit absorption (54).

Excess iron

ESPGHAN warns against prolonged intake of high doses of iron as there are no mechanisms for excretion of iron from the human body and therefore excess iron may have potential for adverse effects. Such effects may cause oxidative injury in preterm babies which could exacerbate conditions such as necrotising enterocolitis and ROP (2, 53). This guideline advises against prolonged dietary iron intakes of >4 mg/kg/day. However, some babies may require high doses of iron for short periods (e.g. babies on erythropoietin may require supplementation up to 6 mg/kg/day) (1).

3.3 Appendix 2: Available Multivitamin Preparations

Vitamin D where prescribed singularly, is as colecalciferol. Preparations can vary by IU/ml.

Vitamin	**Abidec® 0.3 ml**	**Abidec® 0.6 ml**	**DaliVit® 0.3 ml**	**DaliVit® 0.6 ml**	**Healthy Start 5 drops**	**Units**
A	667 (200)	1333 (400)	2500 (750)	5000 (1500)	777 (233)	international units (micrograms)
D	200 (5)	400 (10)	200 (5)	400 (10)	400 (10)	international units (micrograms)
B1 (thiamine)	0.2	0.4	0.5	1	0	milligrams
B2 (riboflavin)	400	800	200	400	0	micrograms
B3 (nicotinamide/niacin)	4	8	2.5	5	0	milligrams
B6 (pyridoxine)	400	800	250	500	0	micrograms
C (ascorbic acid)	20	40	25	50	20	milligrams

3.4 Appendix 3: Alternative Vitamin Supplementation

Born <34weeks and/or <1.8kg	
Fortified breastmilk **OR** Nutriprem 1®, Hydrolysed Nutriprem 1®, SMA Gold Prem 1®	Colecalciferol (400 units/day)
Unfortified breastmilk	Folic Acid 50 micrograms/day (to term) **and** DaliVit® 0.3 mL/day **and** Colecalciferol (400 units/day)
On reaching 1.8kg – 2.0 kg or at discharge (if sooner) ** dependent upon local policy for change to nutrient enriched post discharge formulas	
Fortified Breastmilk **OR** Breastfeeding with Breastmilk Fortifier at home **OR** SMA Gold Prem 2, Nutriprem 2 **OR** Term/Specialist/High Calorie Term Formula	Healthy Start® (5 drops) **OR** Colecalciferol (400 units/day)
Unfortified breastmilk and/or breastfeeding	DaliVit® 0.6 mL/day Stop Colecalciferol Continue folic acid to term
Born 34-37weeks and >1.8kg	
Breast milk or Term Formula	Healthy Start® (5 drops) **OR** Colecalciferol (400 units/day Vitamin D - NOT per kg)

3.5 Appendix 4: Alternative Iron Supplementation

Sodium feredetate contains 27.5 mg of elemental iron in 5 mL and is widely the most acceptable oral solution used in neonatal units.
If sodium feredetate oral solution is not available, ferrous fumarate oral liquid can be considered (53). Ferrous fumarate contains 45 mg of elemental iron in 5 mL.

Equivalent dosing	
Sodium feredetate 27.5mg in 5ml	**Ferrous fumarate 45mg in 5mL**
0.5mL	0.3mL
1mL	0.6mL

3.6 Appendix 5: Available preterm, term and specialist formulas

Specialist formulas used for preterm infants need manipulation and should only be used under the direction of a neonatal dietitian

Formula	Indication for use	Nutrient modification	Suitable for preterm infants?
Preterm Formulas			
Nutriprem 1 SMA gold Prem 1 Hydrolysed Nutriprem	Nutritionally complete breastmilk substitutes, suitable as a sole source of nutrition for preterm and low birthweight infants weighing <1800g		Yes
Post discharge Formulas			
Nutriprem 2 SMA Gold Prem 2	Nutritionally complete breastmilk substitutes, suitable as a sole source of nutrition for preterm and low birthweight infants post discharge.		Yes
Term Standard Formulas			
Cow and Gate First infant milk Aptamil 1 First Infant milk Aptamil Advanced Aptamil Organic first Infant milk SMA Pro first Infant milk SMA Advanced Kendamil First infant milk Hipp Organic 1 First Infant milk Mamia First infant milk	Nutritionally complete breastmilk substitutes, suitable as a sole source of nutrition for infants born at term to 6 months of age.		No – formulated to meet requirements of term infants. Protein:energy ratio not suitable for preterm infants.
Specialist formulas			
Aptamil Pepti Junior	Malabsorption/post GI surgery	Hydrolysed protein/clinically lactose free/MCT fat	No – requires concentration and supplementation to meet preterm requirements.
Aptamil Pepti 1	Cow's milk intolerance	Extensively hydrolysed protein. Contains lactose, so not suitable if malabsorption suspected	No – requires concentration and supplementation to meet preterm requirements.
Nutramigen LGG	Cow's milk intolerance	Extensively hydrolysed protein. Clinically lactose free. Contains probiotics.	No – requires concentration and supplementation to meet preterm requirements. Needs making up with boiling water to denature probiotics.

Neocate Alfamino Puramino	Severe malabsorption –use only after failure with an extensively hydrolysed formula	Amino acids. Neocate does not contain MCT Clinically lactose free High osmolality	No - requires concentration and supplementation to meet preterm requirements.
Monogen	Chylothorax	Whole protein 80% fat as MCT	No – requires concentration and supplementation to meet preterm requirements.
Nutrient dense term formulas			
Similac High Energy Infatrini SMA High Energy	Infants >37 weeks (>2kg) with increased nutritional requirements/fluid restrictions	Nutrient dense. SMA High Energy contains partially hydrolysed protein	No – formulated to meet requirements of term infants. Protein:energy ratio not suitable for preterm infants.
Infatrini Peptisorb	Infants >37 weeks (>2kg) with increased requirements/fluid restrictions AND Malabsorption	Nutrient dense with extensively hydrolysed protein	No – formulated to meet requirements of term infants. Protein:energy ratio not suitable for preterm infants.

3.7 Appendix 6: Total vitamin A & D intakes by infant weight, milk choice and volume

	Nutriprem 1 & Abidec 0.3ml OD						Nutriprem 1 & Abidec 0.6ml OD							
	500g		750g		1000g		1001g		1200g		1500g		1800g	
ml/kg	**150**	**165**	**150**	**165**	**150**	**165**	**150**	**165**	**150**	**165**	**150**	**165**	**150**	**165**
Vitamin A (ug/kg/d)	947	1000	814	871	748	803	948	1003	881	936	815	870	770	825
Vitamin D (IU/kg/d)	586	605	452	470	386	404	585	604	520	537	452	470	408	426
	SMA Gold Prem 1 & Abidec 0.3ml OD						SMA Gold Prem 1 & Abidec 0.6ml OD							
	500g		750g		1000g		1001g		1200g		1500g		1800g	
ml/kg	**150**	**165**	**150**	**165**	**150**	**165**	**150**	**165**	**150**	**165**	**150**	**165**	**150**	**165**
Vitamin A (ug/kg/d)	893	942	760	809	694	743	894	943	827	877	761	811	716	767
Vitamin D (IU/kg/d)	604	624	470	490	404	424	604	624	537	557	470	490	426	446
	Fortified Breastmilk (Cow and Gate) & Abidec 0.3ml OD						Fortified Breastmilk (Cow and Gate) & Abidec 0.6ml OD							
	500g		750g		1000g		1001g		1200g		1500g		1800g	
ml/kg	**150**	**165**	**150**	**165**	**150**	**165**	**150**	**165**	**150**	**165**	**150**	**165**	**150**	**165**
Vitamin A (ug/kg/d)	833	877	700	744	634	678	834	878	767	811	701	745	656	700
Vitamin D (IU/kg/d)	730 (104%)	763 (109%)	596	629	530	563	730 (104%)	763 (109%)	663	696	596	629	552	585
	Fortified Breastmilk (SMA) & Abidec 0.3ml OD						Fortified Breastmilk (SMA) & Abidec 0.6ml OD							
	500g		750g		1000g		1001g		1200g		1500g		1800g	
ml/kg	**150**	**165**	**150**	**165**	**150**	**165**	**150**	**165**	**150**	**165**	**150**	**165**	**150**	**165**
Vitamin A (ug/kg/d)	1055 (106%)	1120 (112%)	922	987	856	921	1057 (106%)	1122 (112%)	989	1054 (105%)	923	988	879	943
Vitamin D (IU/kg/d)	643	667	509	533	443	467	643	667	576	600	509	533	465	489

Table 1: Total daily vitamin A (ug/kg/day) & vitamin D (IU/kg/day) intakes with dose banding by infant weight (Option 1) for infants ≤1.8kg

	500g		750g		1000g		1200g		1500g		1800g	
Nutriprem 1 & Abidec 0.6ml OD												
ml/kg	**150**	**165**	**150**	**165**	**150**	**165**	**150**	**165**	**150**	**165**	**150**	**165**
Vitamin A (ug/kg/d)	1349 (135%)	1404 (140%)	1082 (108%)	1137 (114%)	949	1004	881	936	815	870	770	825
Vitamin D (IU/kg/d)	986 (141%)	1004 (143%)	719 (103%)	737 (105%)	586	604	520	537	452	470	408	426
SMA Gold Prem 1 & Abidec 0.6ml OD												
ml/kg	**150**	**165**	**150**	**165**	**150**	**165**	**150**	**165**	**150**	**165**	**150**	**165**
Vitamin A (ug/kg/d)	1295 (130%)	1344 (134%)	1028 (103%)	1077 (108%)	895	944	827	877	761	811	716	767
Vitamin D (IU/kg/d)	1004 (143%)	1024 (146%)	737 (105%)	757 (108%)	604	624	537	557	470	490	426	446
Fortified Breastmilk (Cow and Gate) & Abidec 0.6ml OD												
ml/kg	**150**	**165**	**150**	**165**	**150**	**165**	**150**	**165**	**150**	**165**	**150**	**165**
Vitamin A (ug/kg/d)	1235 (124%)	1279 (128%)	968	1012 (101%)	835	879	767	811	701	745	656	700
Vitamin D (IU/kg/d)	1130 (161%)	1163 (166%)	863 (123%)	896 (128%)	730 (104%)	763 (109%)	663	696	596	629	552	585
Fortified Breastmilk (SMA) & Abidec 0.6ml OD												
ml/kg	**150**	**165**	**150**	**165**	**150**	**165**	**150**	**165**	**150**	**165**	**150**	**165**
Vitamin A (ug/kg/d)	1457 (146%)	1522 (152%)	1190 (119%)	1255 (126%)	1057 (106%)	1122 (112%)	989	1054 (105%)	923	988	879	943
Vitamin D (IU/kg/d)	1043 (149%)	1067 (152%)	776 (111%)	800 (114%)	643	667	576	600	509	533	465	489

Table 2: Total daily vitamin A (ug/kg/day) & vitamin D (IU/kg/day) intakes with a pragmatic approach (Option 2) for infants ≤1.8kg

Glossary

Term	Definition
EFSA	European Food Safety Agency
ESPGHAN	European Society for Paediatric Gastroenterology Hepatology and Nutrition
ELBW	Extremely Low Birth Weight
VLBW	Very Low Birth Weight
LMPT	Late to Moderate Preterm
WHEAT	Withholding Enteral Feeds Around Packed Red Cell Transfusion
RBP	Retinol Binding Protein
BPD	Bronchopulmonary Dysplasia
IVH	Intraventricular Haemorrhage
ROP	Retinopathy of Prematurity
RCT	Randomized Controlled Trial

This guideline is based on a national resource produced by the British Dietetic Association Neonatal Dietitian's Interest Group - **"The routine supplementation of vitamins and iron and the management of zinc deficiency in preterm and small for gestational age infants"** Jan 2024

Vitamin supplementation in preterm and small for gestational age infants
[redacted] Lead Neonatal Dietitian East Midlands ODN [redacted] MBE, Lead Neonatal Dietitian East of England ODN [redacted], Lead Neonatal Dietitian North West ODN [redacted] Neonatal Dietitian Nottingham University Hospitals NHS Foundation Trust [redacted] Neonatal Dietitian, Jessop Wing, Sheffield Teaching Hospitals [redacted] Advanced Dietetic Practitioner (Neonates), Simpsons Centre for Reproductive Health, NHS Lothian [redacted], Neonatal Pharmacist, University Hospital Southampton
Iron supplementation in preterm and small for gestational age infants
[redacted], Lead Neonatal Dietitian Northern ODN [redacted] Clinical Lead Dietitian: Neonates, Imperial College Healthcare NHS Trust [redacted] Senior Specialist Dietitian, University Hospitals of Leicester NHS Trust [redacted] Childrens Dietitian, Poole General Hospital [redacted], Neonatal lead Dietitian. Betsi Cadwaladr University Health Board [redacted], Lead Neonatal Dietitian West Midlands ODN and Chair of Neonatal Dietitians Interest Group [redacted] Neonatal Pharmacist, University Hospital Southampton
Management of zinc deficiency in preterm and small for gestational age infants
[redacted], Clinical Academic Paediatric Dietitian, Paediatric Intensive Care Unit, Neonates and Paediatric Cardiology, Southampton Children's Hospital, University Hospital Southampton Foundation Trust, and Honorary Associate Professor, University Southampton [redacted] Neonatal Dietitian, Royal Belfast Hospital for Sick Children/Royal Jubilee Maternity Hospital, Belfast [redacted] Paediatric Dietetic Lead, Hampshire Hospitals Foundation Trust [redacted] Neonatal Dietitian, Tunbridge Wells Hospital

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73	Food Standards Agency https://www.food.gov.uk/business-guidance/food-supplements Accessed 30th August 2024.

Exceptional Circumstances Form

Form to be completed in the **exceptional** circumstances that the Trust is not able to follow ODN approved guidelines.

Details of person completing the form:	
Title:	Organisation:
First name:	Email contact address:
Surname:	Telephone contact number:
Title of document to be excepted from:	
Rationale why Trust is unable to adhere to the document:	
Signature of speciality Clinical Lead: Date:	Signature of Trust Nursing / Medical Director: Date:
Hard Copy Received by ODN (date and sign):	Date acknowledgement receipt sent out:

Please return completed form to [redacted] requesting receipt.
Send hard signed copy to:
[redacted], EOE ODN Office Manager
Box 402
Rosie Hospital
Robinson Way
Cambridge University Hospital
Hills Road
Cambridge CB2 0SW

East Sussex Healthcare NHS Trust

Iron Deficiency Treatment Pathway Guideline

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Date ratified:	April 2024
Name of author and title:	[redacted] Lead IV Iron Nurse
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Name of responsible committee/individual:	Haematology Department Governance Group
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Target audience:	General Practitioners, referring Primary care health care professionals. Acute medical Consultants in Emergency care settings. Haematology Consultants. Infusion Unit ESHT staff.
Compliance with CQC Fundamental Standard	Safe Care and Treatment
Compliance with any other external requirements (e.g. Information Governance)	None
Associated Documents:	High Risk Drug, Biologics, IVIG, Iron, Bisphosphonates and Blood.

Did you print this yourself?
Please be advised the Trust discourages retention of hard copies of the procedural document and can only guarantee that the procedural document on the Trust website is the most up to date version.

Version Control Table

Version number and issue number	Date	Author	Reason for Change	Description of Changes Made
V1.0	April 2024	[redacted]	New Document	New Document

Consultation Table

This document has been developed in consultation with the groups and/or individuals in this table:

Name of Individual or group	Title	Date
Dr Anna Cowley	Consultant (lead on this pathway)	03/2024
Imran Younis	Service Manager	03/2024
Lisa Flindall	Head of Nursing	03/2024
Dr Joel Newman	Consultant	03/2024
Dr Richard Grace	Consultant	03/2024
[redacted]	Consultant	03/2024
Dr Elzein Abier	Consultant	03/2024
Dr Nigel Sargeant	Consultant	03/2024
Kelly Mintrim	Service Manager	03/2024
[redacted]	Lead Transfusion Practitioner	03/2024
Gastroenterology Clinical Governance Group		04/2024
Rheumatology Clinical Governance Group		04/2024

This information may be made available in alternative languages and formats, such as large print, upon request. Please contact the document author to discuss.

Table of Contents

1. Introduction

This guidance defines how to refer to use the Iron Deficiency Treatment (IDA) Pathway. This guidance identifies the qualifying criteria for appropriate and safe use of this pathway.

The guidance defines the need for this pathway and how correct use of the pathway will ensure correct, prompt safe medical treatments are administered.

The creation of this guidance and this pathway is to offer an enhanced and improved method of treating Iron Deficiency Anaemia.

2. Purpose

This guidance is intended to support East Sussex Healthcare NHS Trust's (ESHT) staff in identifying correct and best practice. This is a newly created route of patient referral, and this guidance is needed to inform staff members involved in its implementation, identify best practice and provide documented guidance.

As this is a new treatment pathway, the purpose of this guidance is to clearly outline its safe use and define its limitations and clarify medical responsibility.

3. Rationale

The Iron Deficiency Pathway is a new route for Doctors and Healthcare professionals to seek needed remedial Iron Infusions through an efficient safe patient treatment route.

Correct referral to IDA treatment pathway will allow patients to receive Intravenous Iron Infusion in a safe and appropriate time frame. Creation of this treatment route is intended to meet the need of patients who require planned care for Intravenous Iron Infusions who are intolerant of first line oral Iron replacement. The IDA Treatment Pathway is intended to reduce the need for non-elective Intravenous Iron infusions in Urgent care settings.

This guidance references relevant national guidance (See Evidence base/ Reflection section).

This guidance has been created in accordance with the Trusts update (March 2024) Guidelines on the Administration of Intravenous Iron.

The Iron Deficiency Anaemia Treatment pathway will work collaboratively with the Nurse led Infusion Unit (IU) to comply fully with their safe working practices and Trust Referral protocol.

4. Principles

Patients will be referred to the IDA Treatment Pathway via the Electronic Referral System (ERS). Primary care General Practitioners will have to adhere to safety process detailed in section 8 of this policy to ensure referrals are accepted.
The Lead IV Iron Nurse alongside the wider Haematology team will access/triage the referral using the parameters detailed in this policy. If the referral is deemed as clinically inappropriate it will be rejected back to the referring partner if insufficient or non-compliant with this policy.

If a patient is identified as in need of an intravenous Iron Infusion, they can be referred into this IDA Treatment Pathway for remedial treatment. Adherence to this referral guidance is essential to maintain safe practice, improving efficiency and reducing patient waits for needed treatment.

This guidance is intended to optimise patient outcomes, minimise risk, and ensure high quality care for individuals with Iron Deficiency Anaemia.

5. Scope

Patients within the scope of this policy are those diagnosed with Iron Deficiency Anaemia (set out in section 6 and Appendix B).

Patients excluded from the scope of this policy are those who require holistic medical assessment and the patient cohort set out in the exclusion criteria from this pathway (subsection of Appendix B).

The IDA Treatment Pathway guidance is in place to guide all East Sussex Healthcare Staff and service users (referring Primary care healthcare staff) on the agreed pathway for use to ensure safe practice.

6. Definitions

IDA/Iron Deficiency Anaemia: Low Hb: <120g/L Female, <130g/L Male, with Low MCV <80 fl, low MCH < 27 pg AND/OR Ferritin <30 ug/L

Treatment Pathway: An agreed defined route of treatment that originates at referral and ends with completion of treatment and associated discharge letter/completion of pathway letter.

Acute Assessment Area: an area of the Hospital allocated for emergency unplanned admission to hospital.

Nurse led: A clinical area ran and overseen by senior Registered General Nurses not under the direct clinical control of a doctor.

Intravenous Iron: Iron medication administered directly into the vein.

Parental Iron: Oral or iron supplementation taken by mouth.

GP/Healthcare Professional: General Practitioner/Healthcare Professional responsible for patient, (e.g. Specialist Nurse, Practice Nurse)

Pathway Provider: The employee/staff members with clinical responsibility for implementing the Treatment pathway.

Holistic Consultant led Assessment Environment: Healthcare settings such as Accident and Emergency (A&E), Acute Medical Unit (AMU) or Same Dar Emergency Care (SDEC) that have Consultant clinical leadership and undertake Doctor led thorough acute assessment of a patient on arrival.

Electronic Referral System: Shared ICT system used between healthcare settings for patient referral.

7. Accountabilities/Responsibilities

The IDA Treatment Pathway and the designated staff within the Haematology team overseeing the pathway will have clinical responsibility for timely review of patient referrals. In accordance with this guidance the staff overseeing the treatment pathway must accept the referral (if in compliance with referral guidelines, section 8) to allow onward refer for Iron Infusion treatment.

Those needing Intravenous Iron Infusion will predominantly take place on the Nurse led Infusion unit at ESHT. On completion of the prescribed Iron Infusion the patient will be discharged from the IDA Treatment Pathway. The IDA Treatment Pathway will not complete any onward care or follow up, clinical responsibility will return to the referring clinician.

Where the patient referral is rejected /returned by the triage stage of the IDA Treatment Pathway, then clinical responsibility remains with the GP/Healthcare professional who did the referral.

The IDA Treatment Pathway is not a referral for holistic ongoing medical assessment. As detailed in this referral guidance, it is a treatment pathway in which if the patient is accepted in line with referral guidelines it will lead to an appropriate prescribed medical treatment that will mark the end /completion of the pathway. Referring General Practitioners and Speciality

Doctors and Nurses continue to have responsibility for overseeing the on-going assessment and appropriate onward referral, investigations needed for their patients. The IDA Treatment Pathway will not undertake any aspect of patient follow-up, case management or future review.

8. Process

When referring to the IDA Treatment Pathway, please use this guidance and Appendix B of this document to guide best practice.

The IDA Treatment Pathway is not suitable for patients who are acutely unwell (see Appendix B Exclusion Criteria for the IDA Pathway). Patients who require prompt (defined for use in this policy as the next 72 hours) holistic Consultant led assessment should not be referred under this Treatment Pathway and should be correctly referred or signposted to Acute admission routes such as Emergency Department, Acute Medical Unit or Same Day Emergency Care.

Referrals from Primary care should be received via the designated Electronic Referral System (ERS). All designated mandatory completion fields within the referral must be completed. Failure to supply mandated details at point of referral will result in pathway providers declining the referral.

The IDA Treatment Pathway is not a diagnostic investigative patient pathway. At point of referral the following blood tests results must be in place:

- Full Blood Count Within (No older than 8 weeks at point of IDA Pathway referral)
- Serum Ferritin Level (No older than 8 weeks at point of IDA Pathway referral)
- Serum Folate level (No older than 8 weeks at point of IDA Pathway referral)
- Iron Binding Studies (No older than 8 weeks at point of IDA Pathway referral)
- A Serum B12 level available to support IDA diagnosis within 12 months of IDA Pathway referral.

Who can refer to the IDA Treatment Pathway?

Patient referrals can be completed via Electronic Referral Service (ERS) by a trained HealthCare Professional but the Doctor taking clinical responsibility for the patient and this referral must be identified. Referrals made by Specialist Nurses or Primary Care Nurses who do not include a referring doctor (the referral must make clear the doctor who the referral is under) will be refused on the grounds of patient safety. The management of the IDA Treatment

Pathway is to be done by the Lead IV Iron Nurse working under the clinical supervision of the Haematology Consultants. All medication prescribing will be done by Haematology staff with the appropriate prescribing clinical remit and qualifications.

9. Special considerations

Patients who receive treatment via the IDA Treatment Pathway, will receive their Intravenous Iron Infusions on the Nurse led Infusion Unit and all aspects of their care must comply with the Infusion Units referral Protocol (Included in Evidence Base section 10). The Infusion Unit service offered by ESHT does not, due to service configuration accept patients who are non-weight bearing or bed bound. For this reason, patients who are non-weight bearing or bedbound are excluded/ not able to be treatment via the IDA Treatment Pathway and are included in the exclusion criteria for the IDA Treatment Pathway (Appendix B).

Pregnancy and the Need for Intra-venous Iron Infusion:

ESHT Obstetrician leads have instructed that all Iron Infusions in pregnancy should be administered in Maternity Day Assessment or the Frank Shaw Ward.

10. Evidence base/References

- Clinical knowledge summaries (2018). Anaemia – Iron deficiency. National Institute for Health and Care Excellence. Accessed June 2019
- Guidelines for Treatment if Iron Deficiency Anaemia including Referral to Medical Day Case Unit. University Hospitals Leicester. NHS Trust, B1/2020
- Infusion Unit Patient Referral Protocol. V2 East Sussex Healthcare, 07, 2022.
- Intravenous Iron Supplementation- Adult Prescribing and Administration Guidelines (ESHT 2020, in process of ratification 2024)
- UK Guidelines on the Management of Iron Deficiency in Pregnancy. S Pavor, JDaru, DoH. Oxford. 2019
- Iron Deficiency and Anaemia in Adults. RCN Guidance for Nursing Practice. 2019

11. Competencies and training requirements

The creation of an IDA Treatment pathway will require reflection and review as to additional training needs and operational adaption. This will be an ongoing process overseen by key staff highlighted on consultation table.

12. Document Monitoring Table

Element to be Monitored	Lead	Tool for Monitoring	Frequency	Responsible Individual/Group/ Committee for review of results/report	Responsible individual/ group/ committee for acting on recommendations/action plan	Responsible individual/group/ committee for ensuring action plan/lessons learnt are Implemented
Compliance with guidance	Lead Consultant for Haematology, Haematology service manager and Head of Nursing	Clinical Governance. Risk identification and management	3 year policy renewal (minimum)	As required but likely to be under Haematology oversight of pathway.	Haematology Lead Consultant. IV Iron Lead Nurse.	Medicines safety Group, Clinical speciality lead Consultants
Incidents, related to IDA Treatment pathway overseen by Haematology Department (ERS /triage, onward referral)	Lead Consultant for Haematology, Haematology service manager and Head of Nursing	[redacted] incident reporting.	In response to individual incidents	Lead Consultant for Haematology, Haematology service manager and Head of Nursing	IV Iron Lead Nurse Appropriate medical team based on incident details	Medicines safety Group, Clinical speciality lead Consultants

Appendix A: EHIA Form

Equality and Health Inequalities Impact Assessment (EHIA) template

Undertaking EHIA helps us to make sure that our services and polices do not inadvertently benefit some groups more than others, ensuring that we meet everyone's needs, and our legal and professional duties.

This is important because:

- Assessing the potential for services and policies to impact differently on some groups compared with others is a legal requirement.
- People who find it harder to access healthcare services are more likely to present later when their disease may be more progressed, have poorer outcomes from treatment, and need more services than other groups who have better access.

The Equality Act 2010 legally protects people from discrimination in the workplace and in wider society. It is against the law to discriminate against anyone because of:

- age
- gender reassignment
- being married or in a civil partnership
- being pregnant or on maternity leave
- disability
- race including colour, nationality, ethnic or national origin
- religion or belief
- sex
- sexual orientation.

These are called 'protected characteristics. The Act requires that public sector organisations meet specific equality duties in respect of these protected characteristics. This is known as the public sector equality duty.

Public Sector Equality Duty

Public bodies have to consider all individuals when carrying out their day-to-day work – in shaping policy, in delivering services and in relation to their own employees.

Public bodies must have due regard to the need to:

- eliminate discrimination
- advance equality of opportunity
- foster good relations.

Armed Forces Covenant Duty

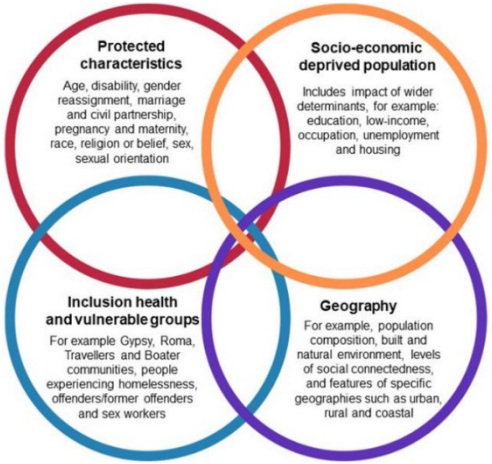
The new Covenant Duty raises awareness of how Service life can impact on the Armed Forces community, and how disadvantages can arise due to Service when members of that community seek to access key local services. The Duty requires organisations to pay due regard to the Covenant principles when exercising functions in healthcare. "Due regard" means that we need to consciously consider the unique obligations and sacrifices made by the Armed Forces; that it is desirable to remove disadvantages faced by the Armed Forces community; and that special provision may be justified in some circumstances.

Health Inequalities Duties- Equity for all
In addition to our legal duties in relation to Protected Characteristics, the Health and Social Care Act and other legislation, NHS Planning Guidance and sector specific recommendations require the NHS to have regard to the need to address health inequalities (or differences in access to or outcomes from healthcare) and take specific action to address them.

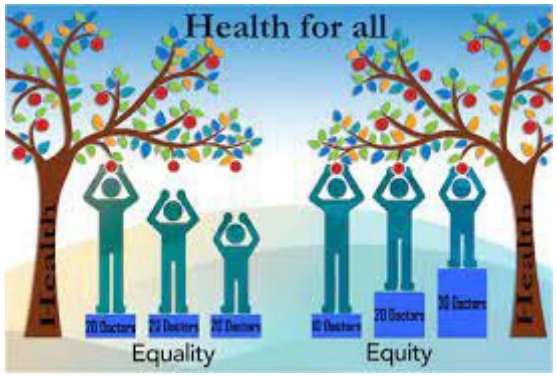
Figure 1 shows the different population groups, factors associated with where we live, or our individual circumstances, which separately, or when combined, influence access to and outcomes from health care.

Getting equal outcomes may require different inputs (or services). In completing an EHIA its important to think about whether a one size fits all approach will generate the same good outcomes for everyone, or whether we might need to make some tweaks or adjustments to enable everyone to benefit equally. The health tree diagram shows that unless we think about the needs of different people, equal services might generate unequal outcomes.

Factors associated with poorer health outcomes (PHE 2021)[1]



The Health Tree[1]



The following principles, drawn from case law, explain what we must do to fulfil our duties under the Equality Act:

- **Knowledge:** everyone working for the Trust must be aware of our equality duties and apply them appropriately in their work.
- **Timeliness:** the duty applies at the time of considering policy options and/or before a final decision is taken – not afterwards.
- **Real Consideration:** the duty must be an integral and rigorous part of your decision-making and influence the process.
- **Sufficient Information:** you must assess what information you have and what is needed to give proper consideration.
- **No delegation:** the Trust is responsible for ensuring that any contracted services which provide services on our behalf can comply with the duty, are required in contracts to comply with it, and do comply in practice. It is a duty that cannot be delegated.
- **Review:** the equality duty is a continuing duty. It applies when a policy/process is developed/agreed, and when it is implemented/reviewed.
- **Proper Record Keeping:** to show that we have fulfilled our duties we must keep records of the process and the impacts identified.

NB: Filling out this EHIA in itself does not meet the requirements of the equality and health inequalities duties. All the requirements above must be fulfilled or the EHIA (and any decision based on it) may be open to challenge. Properly used, an EHIA can be a tool to help us comply with

[1] https://www.researchgate.net/figure/Equality-and-equity-of-medical-resources-distribution_fig2_323266914

our equality and health inequalities duty and as a record that to demonstrate that we have done so. It is advised that you complete the short EHIA training session on [redacted] before completing this EHIA.

SECTION A ADMINISTRATIVE INFORMATION

This form is a central part of how the Trust makes sure and can demonstrate to others that we are meeting our legal duties; and how we can assure ourselves that all patients will get the best outcome for them from our services.

A completed copy of this form must be provided to the decision-makers in relation to your proposal. The decision-makers must consider the results of this assessment when they make their decision about your proposal. **Function/policy/service name and number:**	Iron Deficiency Anaemia Treatment Pathway Guideline		
Main aims and intended outcomes of the function/policy/service and summary of the changes you are making (if existing policy/service):	The aim of the Iron Deficiency Anaemia (IDA) Treatment Pathway Trust Guideline is to provide clinical governance and documented best practice for the new service. The aim is to ensure all key stakeholders are aware of the new service and have an opportunity to shape its creation. The creation of a Pathway guidance will aid clarity on what the service can safely be and what it can't provide. The IDA Treatment Pathway will clarify important aspects of clinical responsibility.		
How will the function/policy/service change be put into practice?	This is a new service; it has been created to meet an identified clinical need. The creation of a route to needed treatment where there wasn't one previously will lead to reduced waits for treatment for patients and with that expected improved clinical outcomes and patient experience.		
Who will be affected/benefit from the policy?	Patients needing with Iron Deficiency Anaemia who need an Intravenous Iron product but are not currently or awaiting specialist medical Team management.		
State type of policy/service	Policy ☐ Guideline	Service ☐	Currently no available route for Primary care medical teams to refer to East Sussex Healthcare NHS Trust for a needed Intravenous Iron Infusion as a planned medical intervention.
	Business Case ☐	Function ☐	Existing
Is an EHIA required? NB: Most policies/functions will require an EA with few exceptions such as routine procedures	Yes ☐		
	No ☐ (If no state reasons)		
Accountable Director: (Job Title)	Lead IV Iron Nurse		
Assessment Carried out by:	Name: [redacted]		
Contact Details:	[redacted]		
Date Completed:	15/03/2024		

SECTION B ANALYSIS AND EVIDENCE

Analysis of the potential impact – Equality and Health Inequalities Duties
For this section you will need to think about all the different groups of people who are more likely to experience poorer access or have poorer outcomes from health and care services. For each group please describe in the first column the potential impact you have identified, in the second column explain how you have arrived at this conclusion and what information you used to identify the potential impact, and in the third column say what you are going to do to prevent it from happening, or which elements of a service or policy specifically address the potential impact. Key things to remember.

- Everyone has protected characteristics but some groups who share one or more protected characteristics may be more likely to have poorer outcomes or access compared with others – and it is this potential that the EHIA process seeks to identify and address.
- The information included here should be proportionate to the type and size of the policy/service/change.
- An update to a policy should demonstrate that you have considered the potential for the policy to impact differently on different groups and taken steps to address that.
- A minor policy update is likely to need to be much less comprehensive than an EHIA for a major service change.
- You will need to know information about who uses or could use your service/policy will apply to (the population). You can use information about current patients or staff, and about the general population the Trust serves.

3. PROTECTED CHARACTERISTICS - Main potential positive or negative impact of the proposal for protected characteristic groups summarised

Please write in the box below a brief summary of the main potential impact (positive or negative) Please state **N/A if your proposal will not impact adversely or positively on the protected characteristic groups listed below, but make sure you include information on how you know there will be no impact.**

This guidance outlines specific criteria for referral to the service which does exclude some patients but for appropriate clinical reasons. These patients have alternative arrangements made depending on their requirements.

Protected characteristic groups	Summary explanation of the *potential* positive or adverse impact of your proposal	How do you know this? (include here a brief explanation of what information you have used to identify potential adverse impact e.g. NICE guidance, local data, evidence reviews, stakeholder or patient feedback	Action that will be taken to address the potential for negative impact.
Age: older people; middle years; early years; children and young people.	This Referral route has an exclusionary limit of patients referred on the service must be 18 years or older. This is linked to adhering to Trust guideline on Iron Deficiency. There are no other exclusionary age restrictions	There is strong evidence that where an NHS workforce is representative of all protected characteristics it fosters a sense of belonging – detailed in the NHS People Plan NHS England » Belonging in the NHS	Lead Consultants to keep under review the age restriction of patient (18 years or older for IDA Treatment Pathway), future review will include the need and clinical efficacy of lowering this age to 16 years.
Disability: physical, sensory and learning impairment; mental health condition; long-term conditions.	No restrictive Disability contents are included in the IDA Treatment Pathway guideline. Referring Doctors are asked to provide medical history and special patient considerations to allow IDA Pathway staff to assess patients correctly and achieve safe treatment tailored to any identified needs.	The Workforce Disability Equality Standard, set out by NHS England details the positive association between increased disability equality and workplace experience for disabled individuals	No expected negative impact.
Gender Reassignment and/or people who identify as Transgender	Individual patient assessment, led by Hematology Consultants will assess medical need and adherence to best practice and clinical guidelines.	Detailed in Creation of guideline. IDA Pathway staff to reflect and ensure best practice is taking place. There is strong evidence that where an NHS workforce is representative of all protected characteristics it fosters a sense of belonging – detailed in the NHS People Plan NHS England » Belonging in the NHS	From the creation of the IDA Treatment pathway leading staff to consider diagnosis parameters and treatment indicators in line with clinical guidance for Male and Female Patients. Alongside best medical care Trust staff must ensure care is inclusive and meets the needs of service uses who have undertaken Gender reassignment or identify as Transgender.
Marriage & Civil Partnership: people married or in a civil partnership.	No identified positive or negative aspect regarding this IDA guideline.	There is strong evidence that where an NHS workforce is representative of all protected characteristics it fosters a sense of belonging – detailed in the NHS People Plan NHS England » Belonging in the NHS	Monitor

Protected characteristic groups	Summary explanation of the *potential* positive or adverse impact of your proposal	How do you know this? (include here a brief explanation of what information you have used to identify potential adverse impact e.g. NICE guidance, local data, evidence reviews, stakeholder or patient feedback	Action that will be taken to address the potential for negative impact.
Pregnancy and Maternity: before and after childbirth and who are breastfeeding.	During creation of this guideline the medical care of Pregnant patients was considered with parameters and restrictions in referral detailed in the policy. These clinical decisions were based on evidenced based agreed best practice.	NICE Guidelines and Specific Product Characteristics for Intra venous Iron Infusion.	
Race:	NICE Guidelines and Specific Product Characteristics for Intra venous Iron Infusion. There is strong evidence that where an NHS workforce is representative of all protected characteristics it fosters a sense of belonging – detailed in the NHS People Plan NHS England » Belonging in the NHS	Clarity of best practice care will aid safe practice and reduce deviation from best practice. Review of Pathway guideline will include review of this area.	
Religion and belief: people with different religions/faiths or beliefs, or none.	No identified positive or negative aspect regarding this IDA guideline.	The Workforce Race Equality Standard, set out by NHS England details how the positive association between increased race equality and workplace experience for disabled individuals	Monitor
Sex:	No identified positive or negative aspects regarding this IDA guideline	Agreed medical parameters for IDA in Males and Females to be used in accordance with Best Practice Guidelines and medication administration guidelines.	Monitor
Sexual orientation	No identified positive or negative aspect regarding this IDA guideline	There is strong evidence that where an NHS workforce is representative of all protected characteristics it fosters a sense of belonging – detailed in the NHS People Plan NHS England » Belonging in the NHS	Monitor
Veterans/Armed Forces Communities	No identified positive or negative aspect regarding this IDA guideline	There is strong evidence that where an NHS workforce is representative of all protected characteristics it fosters a sense of belonging – detailed in the NHS People Plan NHS England »	Monitor

Protected characteristic groups	Summary explanation of the *potential* positive or adverse impact of your proposal	How do you know this? (include here a brief explanation of what information you have used to identify potential adverse impact e.g. NICE guidance, local data, evidence reviews, stakeholder or patient feedback	Action that will be taken to address the potential for negative impact.
		Belonging in the NHS	

4. HEALTH INEQUALITIES -Potential positive or adverse impact for people who experience health inequalities summarised

Please briefly summarise the main potential impact (positive or negative) on people at particular risk of health inequalities (as listed below). **If the policy/procedure is unrelated to patients, this section does not require completion.**

Please state none if you have assessed that there is not an impact, but please make sure you complete the 'how do you know this' column to demonstrate that you have considered the potential for impact**. If you identify the potential for impact for one or more of these groups please complete the full assessment in Appendix A**

Groups who face health inequalities[2]	Summary explanation of the potential positive or adverse impact of your proposal	How do you know this? (include here a brief explanation of what information you have used to identify potential adverse impact e.g. NICE guidance, local data, evidence reviews, stakeholder or patient feedback	Action that will be taken to address the potential for negative impact.
This includes all groups of people who may have poorer access to or outcomes from healthcare services. It includes: People who have experienced the care system; carers; homeless people; people involved in the criminal justice system; people who experience substance misuse or addiction; people who experience income or other deprivation; people	No identified concerns, Iron Deficiency Treatment Pathway will allow for referral for Iron replacement once Primary Care Healthcare staff have identified Iron deficiency.	There is strong evidence that where an NHS workforce is representative of all protected characteristics it fosters a sense of belonging – detailed in the NHS People Plan NHS England » Belonging in the NHS	Ongoing assessment of the IDA Treatment Pathway, Key staff to monitor for any concerns regarding at risk groups.

Groups who face health inequalities[2]	Summary explanation of the potential positive or adverse impact of your proposal	How do you know this? (include here a brief explanation of what information you have used to identify potential adverse impact e.g. NICE guidance, local data, evidence reviews, stakeholder or patient feedback	Action that will be taken to address the potential for negative impact.
with poor health literacy; people living in rural areas with limited access to services; refugees or asylum seekers; people in or who have been in the armed force; other groups who you identify as potentially having poorer access and outcomes.			

SECTION C ENGAGEMENT

5. Engagement and consultation

a. Talking to patients, families and local communities can be a rich source of information to inform health care services. If you are making substantial changes it's likely that you'll have to undertake specific engagement with patients. For smaller changes and policies your may have undertaken some engagement with patient groups, gained insight from routine sources e.g. patient surveys, PALS or Complaints information or information from Healthwatch, you may also have looked at relevant engagement that others have undertaken in the Trust, or locally
Have any engagement or consultative activities been undertaken that considered how to address equalities issues or reduce health inequalities? Please place an x in the appropriate box below.

Yes	No √

b. If yes, please ensure all stakeholders are listed in the consultation table at the beginning of the policy.

SECTION D SUMMARY OF FINDINGS

Reflecting on all of the information included in your review-

6. EQUALITY DUTIES: Is your assessment that your proposal will support compliance with the Public Sector Equality Duty? Please **add an x** to the relevant box below.

	Tackling discrimination	Advancing equality of opportunity	Fostering good relations
The proposal will support?			
The proposal may support?			
Uncertain whether the proposal will support?			

7. HEALTH INEQUALITIES: Is your assessment that your proposal will support reducing health inequalities faced by patients? Please add an x to the relevant box below.

	Reducing inequalities in access to health care	Reducing inequalities in health outcomes
The proposal will support?		
The proposal may support?		
Uncertain if the proposal will support?		

8. Outstanding key issues/questions that may require further consultation, research or additional evidence. Please list your top 3 in order of priority or state N/A

Key issue or question to be answered		Type of consultation, research or other evidence that would address the issue and/or answer the question
1	N/A	
2	N/A	
3	N/A	

9. EHIA sign-off: (this section must be signed)

Person completing the EHIA:	[redacted]	**Date: 15/**03/2024
Line Manager of person completing:	Imran Younis	**Date: 15/03/**2024

Appendix A

Breakdown of Groups who are more likely to experience health inequalities:

Groups who face health inequalities[3]	**Summary explanation of the potential positive or adverse impact of your proposal**	**How do you know this? (include here a brief explanation of what information you have used to identify potential adverse impact e.g. NICE guidance, local data, evidence reviews, stakeholder or patient feedback**	**Action that will be taken to address the potential for negative impact.**
Looked after children and young people	None expected	Service for 18 years plus. Service is a medical intervention based on clinical presentation.	
Carers of patients	None expected.	Service will improve patient treatment options and reduce waits to treatment. This will benefit all patients.	
Homeless people. People on the street; staying temporarily with friends /family; in hostels or B&Bs.	None expected.	Service will improve patient treatment options and reduce waits to treatment. This will benefit all patients.	
People involved in the criminal justice system: offenders in prison/on probation, ex-offenders.	None expected		
People with addictions and/or substance misuse issues	None expected		
People or families on a low income	None expected		
People with poor literacy or health Literacy: (e.g. poor understanding of health services poor language skills).	None expected		Provision of Patient information leaflet prior to Iron replacement. Patients with poor literacy will look to be assisted with effective verbal Nursing intervention, nursing staff to document verbal informed consent.

Groups who face health inequalities[3]	Summary explanation of the potential positive or adverse impact of your proposal	How do you know this? (include here a brief explanation of what information you have used to identify potential adverse impact e.g. NICE guidance, local data, evidence reviews, stakeholder or patient feedback	Action that will be taken to address the potential for negative impact.
People living in deprived areas	None expected		
People living in remote, rural and island locations	None expected		
Refugees, asylum seekers or those experiencing modern slavery	None expected		
People who have served in the Armed Forces	None expected		
Other groups experiencing health inequalities (please describe)	Review on IDA Pathway coming into operation		

Appendix B – EHIA Resources
Sources of Information on the East Sussex population and sources of community or patient insight.

Population Data
State of the County 2021 Focus on East Sussex

East Sussex JSNA

Community Insight

Further Reading on Equality and Health Inequalities

Training

Appendix B:
EHST Iron Deficiency Anaemia Pathway

NO
Consider other forms of anaemia.

Iron Deficiency Anaemia
Low Hb: <120g/L Female, <130g/L Male, with Low MCV <80 fl, low MCH < 27 pg AND/OR Ferritin <30 ug/L -/+ Transaturation <20%.
Pregnancy
Anaemia defined as <105g/l for second and third trimester and <100g/l for Postpartum. as per BCSH guideline

Yes
AND not including any Exclusion Criteria

Exclusion Criteria for this Pathway

- Active Bleeding
- Needs Consultant led Doctor assessment.
- Needs IV Iron infusion acutely within 72 hours (refer to AMU/SDEC)
- Haemodynamic Instability
- PNH, MPN, Venesection-program
- Acute recent history of Melaena
- Symptomatic with Chest pain shortness of Breath
- Splenomegaly- if yes refer to Haematology
- Diagnosed decompensated Liver Disease
- Patients on renal replacement therapy
- Pregnant Patients in any stage of Pregnancy.

Referring General Practitioner/senior Healthcare professional is responsible for initiating the appropriate investigations / referrals (e.g. Gastroenterology cause, Gynaecology Cause).

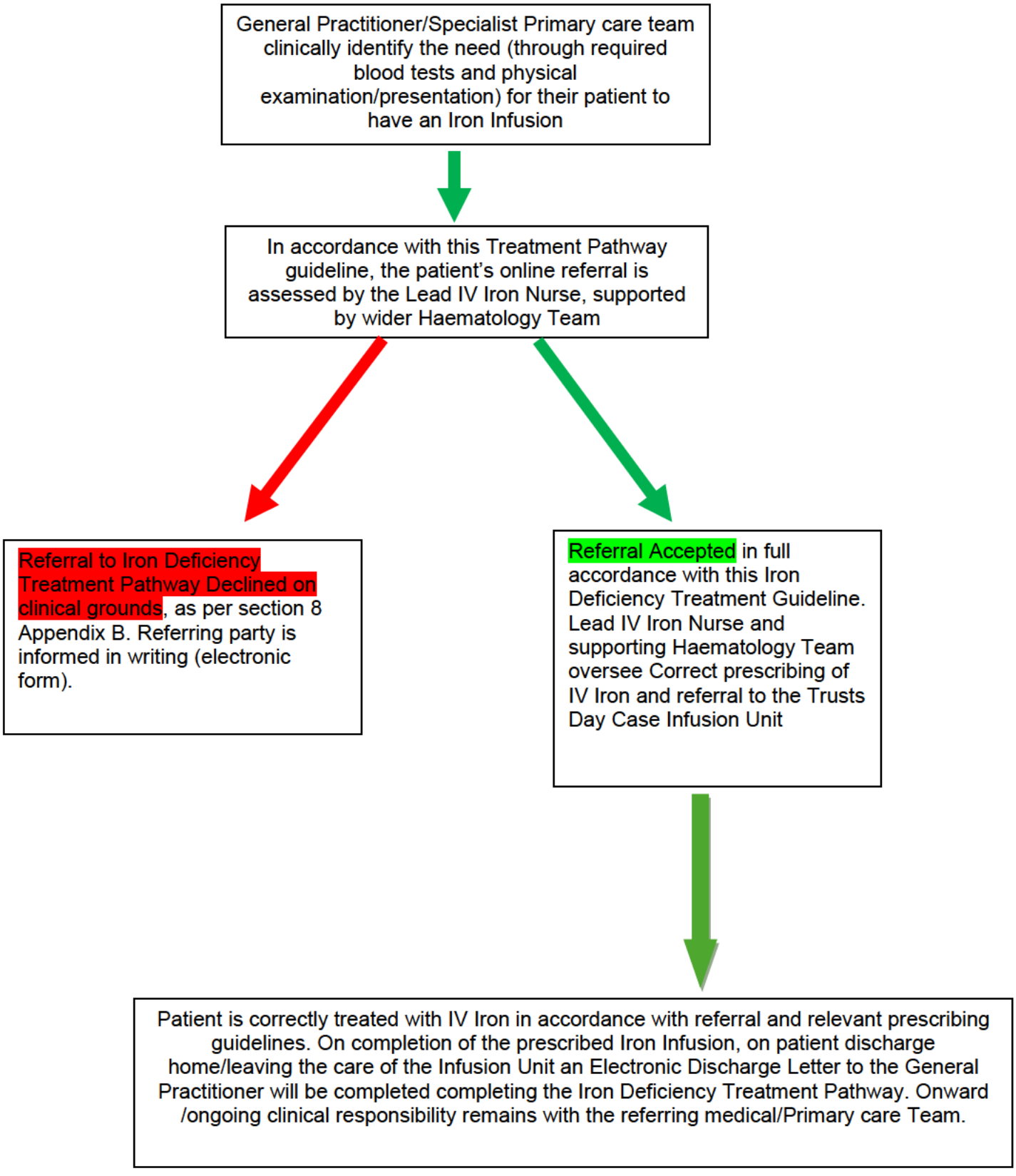
In the meantime, if **NO** exclusion criteria are present Doctor/senior Healthcare professional responsible for the patient can consider electronic referral to the ESHT Iron Deficiency Treatment Pathway

Lead IV Nurse will assess electronic referral in accordance with referral Guidelines.

If referral accepted, IV Lead Nurse will arrange a planned day case appointment for an appropriate IV Iron *infusion within East Sussex Healthcare NHS Trust.

Electronic Trust Discharge letter will be produced on discharge following completion of Iron deficiency Treatment. This will note the completion of the IDA Treatment pathway.

Appendix C: Iron Deficiency Treatment Pathway, Visual Flow Chart 2



Appendix D: [redacted] Proforma Template: Iron Deficiency Anaemia (IDA) Treatment Pathway

Iron Deficiency Anaemia (IDA) Treatment

East Sussex Healthcare NHS Trust

Pathway Referral Form

Send completed referral forms via ERS to: Haematology | General Haematology (Lab Results, Anaemia, MPNs) | RAS Iron Deficiency Treatment Pathway (EDGH) – East Sussex Healthcare Trust – RXC Enquiries: 0300 1315496

This is a treatment pathway for diagnosed iron deficiency anaemia (IDA). The IDA pathway operating staff will not perform clinical assessment, onward referral or clinical follow-up including blood monitoring. See ESHT policy for IDA Treatment Pathway 2024 for full details.

Patient Demographics				**GP Practice Details**	
Surname				GP	
First names				Referral date	
DOB		[Sex]		Email	
NHS No.		BMI	[BMI]	Tel	
Email				Practice ID	
Address				Address	
Tel home				Tel mobile	
Ethnicity					

Supporting Accessibility Information

☐ Accessibility adjustments required (e.g. cognitive, sensory, mobility issues).

Please give details:

☐ Interpreter required. Preferred language:

☐ Carer attending/involved. Contact details:

☐ Permission to contact NOK/third party about referral if necessary

Referral Type

☐ **Routine** (treatment aim 14-28 days) ☐ **Urgent** (treatment aim 4-14 days)

If treatment is needed in next 72 hours the IDA treatment Pathway is not suitable and emergency admission should take place.

Clinical Details and Reason for Referral

Has oral iron supplementation been attempted? ☐ Yes ☐ No

Details:

What is the patient's mobility? ☐ Independent ☐ Uses aids ☐ Non-weightbearing* ☐ Bed-bound*

Details:

Is the patient pregnant? ☐ Yes§ ☐ No

* *Patients who are immobile/ bed bound and non-weight bearing unfortunately cannot currently be treated on this treatment pathway. This restriction is intended to be removed in the future with building, staffing & equipment improvements. At present these patients should be referred to an appropriate consultant-led specialty team.*

§ *Pregnant women are not suitable for the IDA treatment pathway. Please refer directly to appropriate obstetrician services.*

Investigations

The following results must be supplied (date no more than 8 weeks ago):

[Haemoglobin]

[Mean Cell Volume]

[Mean Cell Haemoglobin Concentration]

[Red Cell Distribution Width]

[Serum Ferritin]

[Serum Folate]

[Total Iron Binding Capacity]

Within 12 months:

[Serum B12]

Weight*: [Weight + Date]

* A weight must be completed to allow for dosing calculations.

Referred By

Name		Role	
Contact		Date	

Appendix E: IDA Pathway Prescribing /Referral support information.

Patient PAS sticker

Weight (Dated)			
Date referred to IDA Treatment pathway		Comments	
Date of last relevant Bloods			
HB			
Ferritin			
MCV			
CRP			
Allergies			
Iron Studies			

Was the patient accepted on the IDA Treatment Pathway	*NO* *YES*	*Comments*	
Date Prescription Completed			
Date Referral to Infusion Unit completed			