IV POLICY – INTRAVENOUS (IV) FLUID THERAPY MANAGEMENT IN ADULT PATIENTS IN HOSPITAL

POLICY

Reference	CPG-TW-IVFTinAinH
Approving Body	Deteriorating Patient Group
Date Approved	20th July 2018
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Version	2.1
Summary of Changes from Previous Version	v2.0, Reduced written content to flowchart to assist with compliance v2.1, Amended in line with NEWS2
Supersedes	v2.0, Issued 27th July 2018 to Review Date July 2021
Document Category	• Clinical
Consultation Undertaken	• Renal consultant; • ICU consultant; • Users of policy both medical and nursing • Deteriorating Patient Group
Date of Completion of Equality Impact Assessment	August 2018
Date of Environmental Impact Assessment (if applicable)	August 2018
Legal and/or Accreditation Implications	To promote compliance with NICE guidance
Target Audience	This policy covers all staff groups who are involved in caring for the adult patients receiving care within the Trust (e.g. Registered Nurses and, Doctors, Physiotherapists, Pharmacists, Health Care Support Workers, Operating Department Practitioners).
Review Date	April 2022 (ext3)
Sponsor (Position)	Chief Nurse
Author (Position & Name)	Lead Critical Care Outreach Nurse – Richard Corderoy-Foster
Lead Division/ Directorate	Surgery
Lead Specialty/ Service/ Department	Anaesthetics, Critical Care & CSSD/ Critical Care
Position of Person able to provide Further Guidance/Information	Gareth Moncaster Consultant Intensivist

Associated Documents/ Information	**Date Associated Documents/ Information was reviewed**
Not Applicable	Not Applicable

CONTENTS

1.0 INTRODUCTION

1.1 This policy is based on guidance from the National Institute for Health and Care Excellence (NICE, 2013) Guideline number 174 *Intravenous fluid therapy in adults in hospital* in conjunction

1.2 This policy is issued and maintained by the Chief Nurse (the sponsor) on behalf of the Trust, at the issue defined on the front sheet, which supersedes and replaces all previous versions.

1.3 This policy is limited to Sherwood Forest Hospitals NHS Foundation Trust sites including Newark Hospital, Kings Mill Hospital and Mansfield Community Hospital site and covers the '5 Rs' of intravenous (IV) fluid therapy:

- Resuscitation with IV fluids
- Routine maintenance IV fluids
- Replacement IV fluids
- Redistribution
- Reassessment

1.4 This policy covers the prescription and monitoring of IV fluid and electrolyte therapy, incorporating the indications for IV fluid therapy, the reasons for choice of various fluids available and the principles of assessing fluid balance in disease states.

2.0 POLICY STATEMENT

2.1 **Staff groups:** This policy covers all staff groups who are involved in patient fluid management (e.g. RNs, RM/RMNs, doctors, physiotherapists, pharmacists, HCAs, operating department practitioners)

2.2 **Clinical areas:** This policy covers all adult clinical areas

2.3 **Patient group(s):** This policy covers all adult patients requiring consideration of treatment with IV fluid therapy.

2.4 **Exclusions:** The following areas are exempt

2.4.1 Paediatric patients under 16 years of age, in designated paediatric areas.
2.4.2 Neonatal patients
2.4.3 Pregnant women
2.4.4 Those patients with severe liver or renal disease (including patients receiving regular dialysis), diabetes or burns
2.4.5 Patients needing intensive monitoring on the intensive care or high dependency unit (level 3 or level 2 care respectively) who may require inotropic therapy
2.4.6 Patients during surgical anaesthesia
2.4.7 Patients with traumatic brain injury (including those needing neurosurgery)

3.0 DEFINITIONS/ ABBREVIATIONS

The trust:	means the Sherwood Forest Hospitals NHS Foundation Trust.
Staff:	means all employees of the Trust including those managed by a third party organisation on behalf of the Trust.
Expert:	NICE (2013) uses this term in respect of fluid management. This is a healthcare professional who has core competencies to diagnose and manage acute illness. These competencies can be delivered by a variety of models at a local level, such as a critical care outreach team, a hospital out of hours team or a specialist trainee in an acute medical or surgical specialty.
Vital signs:	Respiratory rate (RR), heart rate (HR), blood pressure (BP), pulse oximeter oxygen saturation (SpO_2), temperature, and level of consciousness (ACVPU). These vital signs are MANDATORY observations and should be used in conjunction with the physiological track and trigger score NEWS, see the trust's Observations and Escalation Policy for Adult Inpatients
Observations:	The action or process of obtaining and recording vital signs: RR, HR, BP, SpO2, temperature, level of consciousness (A This policy covers all staff groups who are involved in caring for the adult patients receiving care within the Trust (e.g. Registered Nurses and, Doctors, Physiotherapists, Pharmacists, Health Care Support Workers, Operating Department Practitioners).CVPU) as well as the pain score, blood glucose, urine output and the presence of supplemental oxygen.
Track and trigger score:	A physiological track and trigger score is used to identify patients at risk of deterioration. The vital signs (and the presence of oxygen therapy) are scored individually in relation to their deviation from the norm from which a cumulative score is calculated. The score is used in conjunction with a graded response protocol to trigger a call for expert help where appropriate.
NEWS:	The National Early Warning Score the physiological track and trigger score the assessment tool of choice to identify the deteriorating adult across the Trust, see the Observations and Escalation Policy for Adult Inpatients
Nervecentre:	Wireless system for recording vital signs and calculating NEWS scores, but also an access port and repository for other physiological signs
SpO2:	Oxygen saturation measured with pulse oximetry
ACVPU:	This tool is used to rapidly assess the level of consciousness where the patient is identified as A – **A**lert, C – New onset **C**onfusion or delirium V – responding to **V**erbal stimuli, P – responding to **P**ainful stimuli only or U – **U**nresponsive. Any person scoring C, V, P or U will require further, in-depth assessment using the Glasgow Coma Score (GCS). These parameters all score 3 on NEWS and thus trigger a call to the Ward Based Doctor/ Night Team Leader for further review. CCOT may also be contacted for further support.
GCS:	Glasgow Coma Score, a more in-depth tool than the ACVPU, used to assess a patient's neurological status. GCS should be used in all patients who score C, V, P or U on the ACVPU (unless the altered level of consciousness is expected e.g. due to the effects of sedation medication in theatre recovery). The GCS is recorded on Nervecentre where available, but where not, dedicated paper charts should be used.
HCA:	Healthcare Assistant– generic term for unregistered nurses

RN:	Registered nurse
RM:	Registered midwife (RMN – Registered midwife nurse)
CCOT:	Critical Care Outreach Team – specialist critical care nurse available at Kings Mill site only. This role is fulfilled in part by HOOH at Kings Mill
ART:	The Acute Response Team offer a higher level of care than the CCOT alone – ART is a team of specialist critical care professionals, including the CCOT nurse (or Night Team Leader out of hours), a medical registrar, an anaesthetist from the ICCU and a Resuscitation Training Officer. ART is available at the Kings Mill site only, triggered by a NEWS score 7 or single parameter 3 or if clinical judgement deems required
IV:	Intravenous fluid administration can be given via the peripheral or central veins
ODP:	Operation Department Practitioner
PGD:	Patient Group Direction – a PGD is available for nurses to administer two boluses of 500mls IV 0.9% sodium chloride in hypovolemic states.
Portsmouth sign:	Positive Portsmouth sign occurs when the heart rate is higher than the systolic blood pressure and indicates potential hypovolemia
ACP:	Acute Care Practitioners
HOOH:	Hospital Out Of Hours (based at Kings Mill)

4.0 ROLES AND RESPONSIBILITIES

4.1 All staff under the scope of this policy and prior to implementing care are responsible for:

Ensuring that the correct lawful consent has been gained and documented. If capacity is in doubt, a two stage test should be undertaken. If the patient is found to lack capacity complete the best interests checklist and plan care in their best interests. Please see the Trust's "Consent Policy" and "Mental Capacity Act Policy" for further information.

4.2 The doctor is responsible for:

4.2.1 Assessing the patient's fluid and electrolyte status
4.2.2 Collaborating with the RN to formulate a fluid management plan
4.2.3 Communicating with those who will provide additional assistance when required (i.e. other more senior doctors, CCOT, ART, ACP,HOOH).
4.2.4 Prescribing IV fluids where required, while cognisant of the risks, benefits and side effects of that treatment.
4.2.5 Reassessing the patient's fluid and electrolyte status within 24 hours.

4.3 The RN is responsible for:

4.3.1 Assessing the patient's fluid balance status; monitoring the six mandatory vital signs (*see the trust's Observations and Escalation Policy for Adult Inpatients);* NEWS scoring; and the completion of other associated tools e.g.
- Hydration Risk Assessment Tool (currently available from the intranet)
- Hydration Chart (currently available from the intranet)
- Fluid Balance Charts (available from the trust's Forms Management system, reference FKIN030204)

4.3.2 Communicating with those who will provide additional assistance and expertise.
4.3.3 Collaborating with the admitting doctor to formulate a management plan.
4.3.4 Ensuring all patient data is documented accurately, clearly and prospectively.
4.3.5 Administering the IV fluid, using an appropriate infusion device if required).

4.4 The HCA is responsible for:

4.4.1 Supporting the registered nurse in monitoring the patient's vital signs and recording any input and outputs on the relevant chart (electronic at sites where available).

4.4.2 Reporting back immediately to the RN any abnormalities or changes in the patient's condition or behavioural patterns that may indicate deterioration.

4.4.3 Reporting back immediately to the RN any deviations from the normal range in the vital signs or NEWS score, fluid intake or output.

4.5 The ward sister/charge nurse is responsible for:

4.5.1 Ensuring that all nursing staff, who carry out fluid management, are competent to do so.

4.5.2 Ensuring that all nursing staff, who carry out PGDs in their area, have the appropriate documentation signed off and are competent to do so.

4.5.3 Ensuring that all registered nurses and HCA are deemed competent to monitor and document fluid balance.

4.5.4 Ensuring that the ward staff have access to infusion devices as and when required and that the staff are competent to use them.

4.6 The IV fluid lead is responsible for

4.6.1 The IV fluid lead will be responsible for clinical governance, audit and review of IV fluid prescribing and patient outcomes and co-ordinating training.

5.0 APPROVAL

Approved at Deteriorating Patient Group

6.0 DOCUMENT REQUIREMENTS

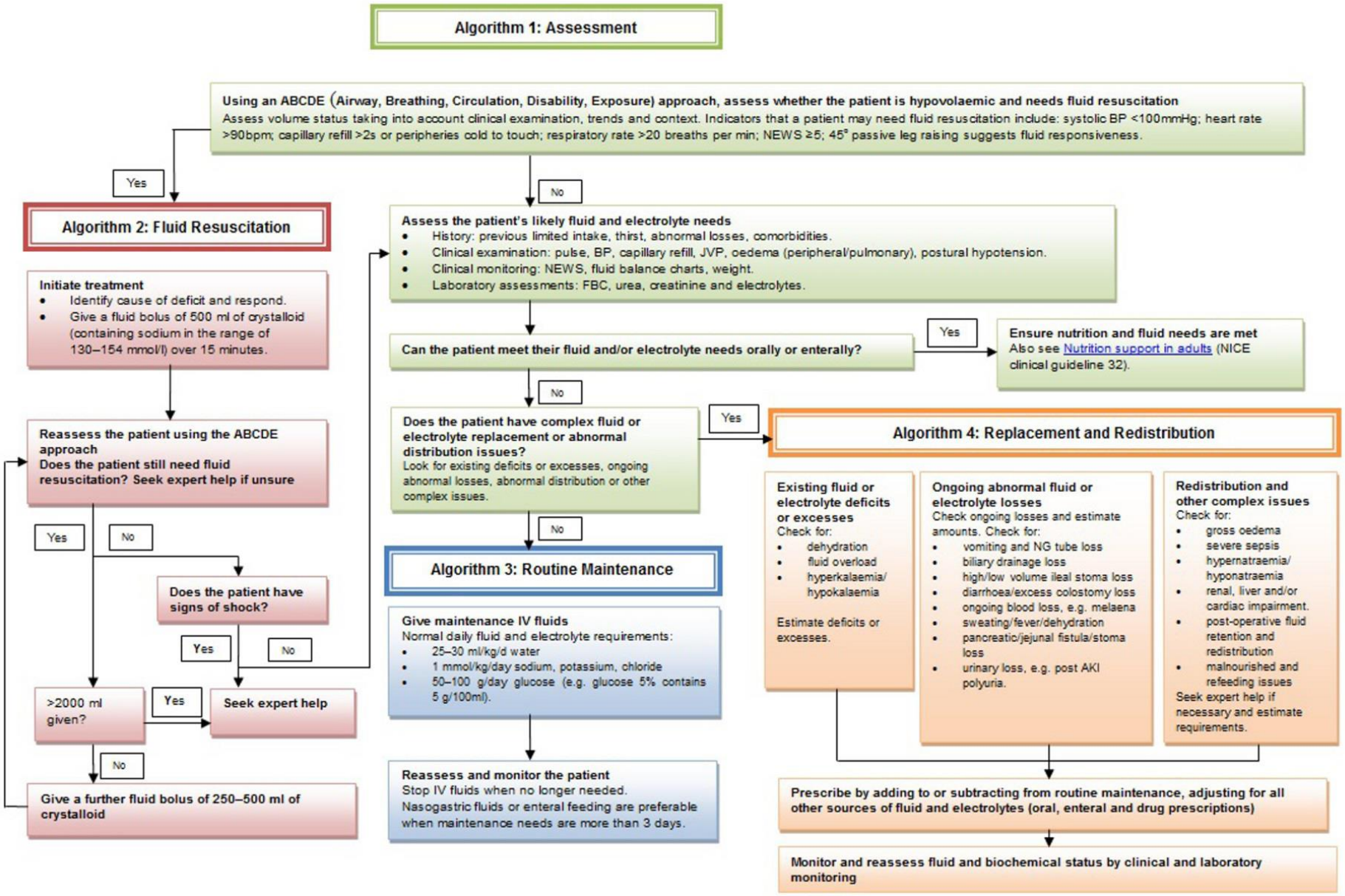
6.1 Intravenous (IV) fluid therapy must be given as part of a protocol – An overarching algorithm with four individual algorithms:

6.1.1 Patients' fluid and electrolyte needs must be assessed using algorithm 1 – Assessment (green).

6.1.2 If patients need IV fluid resuscitation use algorithm 2 – Fluid Resuscitation (red).

6.1.3 If patients need IV fluid for routine maintenance use algorithm 3 – Routine Maintenance (blue).

6.1.4 If patients need IV fluids to address existing deficits or excesses, on-going abnormal losses or abnormal fluid distribution, follow algorithm 4 – Replacement and Redistribution (orange).


Algorithm 1: Assessment
Using an ABCDE (Airway, Breathing, Circulation, Disability, Exposure) approach, assess whether the patient is hypovolaemic and needs fluid resuscitation
Assess volume status taking into account clinical examination, trends and context. Indicators that a patient may need fluid resuscitation include: systolic BP <100mmHg; heart rate >90bpm; capillary refill >2s or peripheries cold to touch; respiratory rate >20 breaths per min; NEWS ≥5; 45° passive leg raising suggests fluid responsiveness.
Yes
No
Algorithm 2: Fluid Resuscitation
Initiate treatment
Identify cause of deficit and respond.
Give a fluid bolus of 500 ml of crystalloid (containing sodium in the range of 130–154 mmol/l) over 15 minutes.
Reassess the patient using the ABCDE approach
Does the patient still need fluid resuscitation? Seek expert help if unsure
Yes
No
Does the patient have signs of shock?
Yes
No
>2000 ml given?
Yes
Seek expert help
No
Give a further fluid bolus of 250–500 ml of crystalloid
Assess the patient's likely fluid and electrolyte needs
History: previous limited intake, thirst, abnormal losses, comorbidities.
Clinical examination: pulse, BP, capillary refill, JVP, oedema (peripheral/pulmonary), postural hypotension.
Clinical monitoring: NEWS, fluid balance charts, weight.
Laboratory assessments: FBC, urea, creatinine and electrolytes.
Can the patient meet their fluid and/or electrolyte needs orally or enterally?
Yes
Ensure nutrition and fluid needs are met
Also see Nutrition support in adults (NICE clinical guideline 32).
No
Does the patient have complex fluid or electrolyte replacement or abnormal distribution issues?
Look for existing deficits or excesses, ongoing abnormal losses, abnormal distribution or other complex issues.
Yes
Algorithm 4: Replacement and Redistribution
No
Algorithm 3: Routine Maintenance
Give maintenance IV fluids
Normal daily fluid and electrolyte requirements:
25–30 ml/kg/d water
1 mmol/kg/day sodium, potassium, chloride
50–100 g/day glucose (e.g. glucose 5% contains 5 g/100ml).
Reassess and monitor the patient
Stop IV fluids when no longer needed.
Nasogastric fluids or enteral feeding are preferable when maintenance needs are more than 3 days.
Existing fluid or electrolyte deficits or excesses
Check for:
dehydration
fluid overload
hyperkalaemia/ hypokalaemia
Estimate deficits or excesses.
Ongoing abnormal fluid or electrolyte losses
Check ongoing losses and estimate amounts. Check for:
vomiting and NG tube loss
biliary drainage loss
high/low volume ileal stoma loss
diarrhoea/excess colostomy loss
ongoing blood loss, e.g. melaena
sweating/fever/dehydration
pancreatic/jejunal fistula/stoma loss
urinary loss, e.g. post AKI polyuria.
Redistribution and other complex issues
Check for:
gross oedema
severe sepsis
hypernatraemia/ hyponatraemia
renal, liver and/or cardiac impairment.
post-operative fluid retention and redistribution
malnourished and refeeding issues
Seek expert help if necessary and estimate requirements.
Prescribe by adding to or subtracting from routine maintenance, adjusting for all other sources of fluid and electrolytes (oral, enteral and drug prescriptions)
Monitor and reassess fluid and biochemical status by clinical and laboratory monitoring

7.0 MONITORING COMPLIANCE AND EFFECTIVENESS

7.1 Monitoring compliance with elements of this policy across the Trust will be co-ordinated by the NICE guideline lead on a 12-monthly basis. Detail is tabulated below.

7.2 Additional on-going monitoring in areas where poor compliance is identified will be developed with individual ward teams with support from the NICE Lead.

Minimum Requirement to be Monitored **(WHAT – element of compliance or effectiveness within the document will be monitored)**	**Responsible Individual** **(WHO – is going to monitor this element)**	**Process for Monitoring e.g. Audit** **(HOW – will this element be monitored (method used))**	**Frequency of Monitoring** **(WHEN – will this element be monitored (frequency/ how often))**	**Responsible Individual or Committee/ Group for Review of Results** **(WHERE – Which individual/ committee or group will this be reported to, in what format (eg verbal, formal report etc) and by who)**
Compliance with key priorities • 5Rs • Algorithms 1-4 • Assessment of patient's fluid and electrolyte needs • Fluid management plans • Monitoring and daily assessments	IV fluid lead will co-ordinate	An evaluation of 60 patient case-notes using the *pro forma* provided by NICE (2013) via Meridian looking at 5 inpatient notes each month	Repeated at 12 monthly intervals	Deteriorating Patient Group (DPG)
Critical incidents associated with IV fluid administration	IV fluid lead will co-ordinate	Via Datix	6 monthly intervals	Deteriorating Patient Group (DPG)

8.0 TRAINING AND IMPLEMENTATION

The contents of this policy will be integrated into training programmes already provided across the Trust which includes

- Acute Illness Management (AIMS) multidisciplinary course (monitored by the Resuscitation Team)
- Mandatory Trust training – Core Skills for HCA and Essential Skills for RNs (monitored by Training and Development Department and Sisters/Charge Nurses).
- Trust Induction training for all staff (monitored by Training and Development Department).
- Foundation year and Core Medical Training teaching days
- NEWS2 e-learning resource available at https://sherwood-eacademy.co.uk/login/index.php
- Doctors and nurses can also access the NICE e-learning module for IV fluids assessment and prescription found at http://elearning.nice.org.uk/enrol/index.php?id=6

Pre-registration training for doctors should include physiology, pathophysiology, the 5Rs, assessing the risks, benefits and harms of IV fluids, **prescribing and administering** IV fluids, monitoring the patient's response, evaluating and documenting changes and taking appropriate action as required. Including recognition, assessment and prevention of inappropriate IV fluid therapy e.g. pulmonary oedema, peripheral oedema, volume depletion, shock and acute kidney injury

Pre-registration training for nurses should include physiology, pathophysiology, the 5Rs, assessing the risks, benefits and harms of IV fluids, **administering** IV fluids, monitoring the patient's response, evaluating and documenting changes and taking appropriate action as required. Including assessment, recognition and prevention of inappropriate IV fluid therapy e.g. pulmonary oedema, peripheral oedema, volume depletion, shock and acute kidney injury

Initial training for all new HCAs includes the measurement and documentation of all six mandatory vital signs and fluid balance.

9.0 IMPACT ASSESSMENTS

- This document has been subject to an Equality Impact Assessment, see completed form at Appendix A
- This document has been subject to an Environmental Impact Assessment, see completed form at Appendix B

10.0 EVIDENCE BASE (Relevant Legislation/ National Guidance) AND RELATED SFHFT DOCUMENTS

Evidence Base:

This policy has been developed with reference to the following guidance

- National Institute for Health and Care Excellence (NICE, 2007) *Acutely Ill Patients in Hospital. Recognition of and response to acute illness in adults in hospital. Clinical Guideline No 50* available at www.nice.org.uk last accessed 10/08/18
- National Institute for Health and Care Excellence (NICE, 2013) *Intravenous fluid*

therapy in adults in hospital NICE clinical guideline 174 available at www.nice.org.uk/cg174 last accessed 10/08/18
- NICE (2006) *Nutrition support in adults: Oral nutrition support, enteral tube feeding and parenteral nutrition. NICE clinical guideline 32* Found at https://www.nice.org.uk/guidance/cg32 Last accessed 10/08/18
- Royal College of Physicians (2017) *National Early Warning Score (NEWS) 2. Standardising the assessment of acute-illness severity in the NHS.* Available at https://www.rcplondon.ac.uk/projects/outputs/national-early-warning-score-news-2 [Last accessed 21st June 2018]

Related SFHFT Documents:

- This policy does not cover the practical administration of IV fluids and is therefore linked with the following: "Policy for the care of the patient undergoing Intravenous Therapy (Bolus, Continuous and Intermittent)".
- See also: "The Observations Policy for Adult Patients" to aid with NEWS and escalation procedures for critically ill/ deteriorating patients.
- Policy for consent to examination, treatment and care
- Mental Capacity Act Policy

11.0 KEYWORDS

5Rs; resuscitation; routine maintenance; replacement; redistribution and reassessment; NICE CG 174 clinical guideline;

12.0 APPENDICES

- Appendix A – Equality Impact Assessment Form (EQIA)
- Appendix B – Environmental Impact Assessment Form

APPENDIX A – EQUALITY IMPACT ASSESSMENT FORM (EQIA)

Name of service/policy/procedure being reviewed: INTRAVENOUS FLUID THERAPY MANAGEMENT IN ADULT PATIENTS IN HOSPITAL – Policy			
New or existing service/policy/procedure: Existing			
Date of Assessment: July 2018			
For the service/policy/procedure and its implementation answer the questions a – c below against each characteristic (if relevant consider breaking the policy or implementation down into areas)			
Protected Characteristic	**a) Using data and supporting information, what issues, needs or barriers could the protected characteristic groups' experience? For example, are there any known health inequality or access issues to consider?**	**b) What is already in place in the policy or its implementation to address any inequalities or barriers to access including under representation at clinics, screening?**	**c) Please state any barriers that still need to be addressed and any proposed actions to eliminate inequality**
The area of policy or its implementation being assessed:			
Race and Ethnicity	None	Clear guidelines in terms of implementing the policy	None
Gender	None	Clear guidelines in terms of implementing the policy	None
Age	None	Clear guidelines in terms of implementing the policy	None
Religion	None	Clear guidelines in terms of implementing the policy	None
Disability	None	Clear guidelines in terms of implementing the policy	None
Sexuality	None	Clear guidelines in terms of implementing the policy	None
Pregnancy and Maternity	None	Clear guidelines in terms of implementing the policy	None
Gender Reassignment	None	Clear guidelines in terms of implementing the policy	None
Marriage and Civil Partnership	None	Clear guidelines in terms of implementing the policy	None
Socio-Economic Factors (i.e. living in a poorer neighbourhood / social deprivation)	None	Clear guidelines in terms of implementing the policy	None

What consultation with protected characteristic groups including patient groups have you carried out? • End user staff groups, Specialist Teams and Deteriorating Patient Group
What data or information did you use in support of this EqIA? • Reviewed in line with national guidance
As far as you are aware are there any Human Rights issues be taken into account such as arising from surveys, questionnaires, comments, concerns, complaints or compliments? • **No**
Level of impact From the information provided above and following EQIA guidance document Guidance on how to complete an EIA (click here), please indicate the perceived level of impact: Low Level of Impact For high or medium levels of impact, please forward a copy of this form to the HR Secretaries for inclusion at the next Diversity and Inclusivity meeting.
Name of Responsible Person undertaking this assessment: Richard Corderoy-Foster
Signature:
Date: August 2018

APPENDIX B – ENVIRONMENTAL IMPACT ASSESSMENT

The purpose of an environmental impact assessment is to identify the environmental impact, assess the significance of the consequences and, if required, reduce and mitigate the effect by either, a) amend the policy b) implement mitigating actions.

Area of impact	Environmental Risk/Impacts to consider	Yes/No	Action Taken (where necessary)
Waste and materials	• Is the policy encouraging using more materials/supplies? • Is the policy likely to increase the waste produced? • Does the policy fail to utilise opportunities for introduction/replacement of materials that can be recycled?	No to All	
Soil/Land	• Is the policy likely to promote the use of substances dangerous to the land if released? (e.g. lubricants, liquid chemicals) • Does the policy fail to consider the need to provide adequate containment for these substances? (For example bunded containers, etc.)	No to All	
Water	• Is the policy likely to result in an increase of water usage? (estimate quantities) • Is the policy likely to result in water being polluted? (e.g. dangerous chemicals being introduced in the water) • Does the policy fail to include a mitigating procedure? (e.g. modify procedure to prevent water from being polluted; polluted water containment for adequate disposal)	No to All	
Air	• Is the policy likely to result in the introduction of procedures and equipment with resulting emissions to air? (For example use of a furnaces; combustion of fuels, emission or particles to the atmosphere, etc.) • Does the policy fail to include a procedure to mitigate the effects? • Does the policy fail to require compliance with the limits of emission imposed by the relevant regulations?	No to All	
Energy	• Does the policy result in an increase in energy consumption levels in the Trust? (estimate quantities)	No to All	
Nuisances	• Would the policy result in the creation of nuisances such as noise or odour (for staff, patients, visitors, neighbours and other relevant stakeholders)?	No to All	