Fluid Balance Guideline

This guidance does not override the individual responsibility of health professionals to make appropriate decision according to the circumstances of the individual patient in consultation with the patient and /or carer. Health care professionals must be prepared to justify any deviation from this guidance.

Introduction

Fluid balance is a term used to describe the balance of input and output of fluids in the body, to allow metabolic processes to function properly and thereby maintaining optimal hydration (Marieb and Hoehn, 2018). Maintenance of adequate hydration is vital to health and preventing the deterioration of the acutely unwell patient. Effective and consistent fluid management is recognised nationally as being an area of weak practice with inadequate fluid balance monitoring and record keeping having been identified as contributing factors to the poor outcome of acutely unwell patients.

Fluid balance refers to the procedure and documentation of measuring fluid input and output to determine whether they are balanced. An accurate intake and output record provides valuable data for assessing and evaluating the patient's condition.

This guideline is for use by the following staff groups :

This policy applies to all medical and nursing staff, health care assistants and allied health professionals (AHP) involved in the care of patients admitted to hospital and requiring fluid management support. This policy relates to all adult (16 years and older) patients within the Trust and does not include people younger than 16 years old, pregnant women and patients in End of Life Care.

Lead Clinician(s)

Alison Robinson	Deputy Chief Nursing Officer
Approved by Nutrition and Hydration Committee on:	16th October 2024
Review Date: This is the most current document and should be used until a revised version is in place	16th October 2027

Key amendments to this guideline

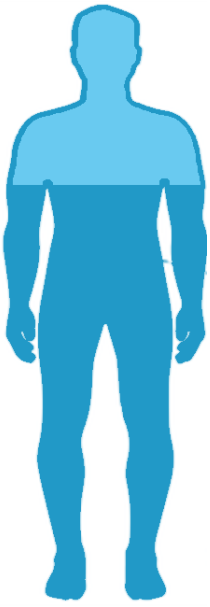
Date	Amendment	Approved by:
16/10/2024	Document reviewed and approved for another three years	Nutrition and Hydration Steering Group

What is Fluid Balance?

Fluid balance is a term used to describe the balance of input and output of fluids in the body, to allow metabolic processes to function properly.

In order to maintain homeostasis, the adult human body needs a fluid intake of 2-3 litres (25-30ml / kg per day), allowing it to keep a balance of the nutrients, oxygen and water, which are necessary to preserve a stable healthy internal environment. Output should be roughly equal, though 'insensible losses' may give a slightly positive balance

55-60% of our total body weight consists of fluid. This fluid is composed of water and electrolytes such as sodium, chloride, potassium.

Forms saliva (digestion)	What does water do for the body? 	Needed by the brain to manufacture hormones and neurotransmitters
Flushes body waste, mainly in urine		Regulates body temperature (sweating and respiration)
Keeps mucosal membranes moist		Acts as a shock absorber for brain and spinal cord
Water is the major component of most body parts		Converts food to components needed for survival - digestion
Allows body's cells to grow, reproduce and survive		Helps deliver oxygen all over the body
Lubricates joints		

Why monitor fluid balance?

Injury or Illness can alter fluid balance. Hypo-perfusion of vital organs may occur with lower circulating volumes caused by dehydration or redistribution within the body during an inflammatory response post trauma, in Cancer or during Sepsis, requiring fluid replacement. Alternatively, an 'overload' may occur as a result of poor cardiac or renal function or excessive fluid intake orally or intravenously.

All fluid intake and output, whatever the source, must be documented using quantifiable amounts

How do we monitor fluid balance?

Knowing the signs and symptoms of Fluid Imbalance in the body is a crucial aspect of hospital care and assessment. It is assessed in 3 ways: physical assessment, blood results and fluid balance documentation.

1. Physical assessment

Vital Signs

- Overload may present with: tachycardia, hypertension, increased respiratory rate/effort/noise/moist cough.
- Fluid depletion may present with hypotension, postural drop, a lowered 'pulse pressure', rapid, shallow respirations and a rapid weak thready pulse.

Skin elasticity – 'tissue turgour'.

- Skin is dry and less elastic with dehydration
- Presence of oedema indicates overload

Capillary refill time

- Good indicator of intravascular pressure/ volume (and hydration). Blood should return to area post gentle pressure in less than 2 seconds. This will be slower in deficit and faster in overload.

Facial/Oral Assessment

- Mucous membranes dry/moist – mouth, tongue, conjuntiva, saliva – thick, sticky in depletion or copious and frothy in overload.
- Sunken facial features particularly around eyes indicate severe depletion or are there signs of oedema?

Weight

- Patients should be weighed weekly.
- If daily weights are required these should be conducted at the same time each day.

Urine output

- Oliguria – output ↓0.5mls per kg per hour
- Anuria – absence of urine ↓100mls over 24 hours

2. Blood results

An imbalance of electrolytes in the blood can lead to fluid imbalance. Laboratory blood tests such as urea and electrolytes, glucose, magnesium, calcium will determine discrepancies and lead to the right treatment.

Symptoms	Usual findings	Indications for fluid deficit	Indications for fluid overload
Sodium	135–145 mmol/L	Raised	Lowered
Potassium	3.5–5 mmol/L	May be lowered if cause of fluid deficit is gastrointestinal losses	Normal
Urea	2.5–6.4 mmol/L	Increased	Normal
Creatinine	Male: 63–116 µmol/L Female: 54–98 µmol/L	Normal, but eventually rises with prolonged poor renal perfusion	Normal, unless cause of overload is renal dysfunction
Other			
Serum osmolarity	275–295 mOsmol/kg	Increased	Decreased
Urine osmolarity	50–1400 mOsmol/kg	Increased	Decreased

3. Fluid balance documentation

Identifying a positive (↑input) or negative (↑ output) balance is essential, as redressing any imbalance is vitally important. As well as aiding assessment, together with other vital signs it allows us to evaluate and adapt our care, replacing and restricting fluids appropriately to achieve stability.
An informational video on how to document fluid balance on Sunrise Electronic Patient Record (EPR) has been produced by the Digital Training Team (Appendix 1) and can be accessed either via the Intranet Electronic Patient Record (EPR) (sharepoint.com) or by accessing YouTube EPR Fluid Balance Demonstration - YouTube
Staff will learn how to enter information into the flowsheet, add parameters, eg IV fluids, IV medication, blood products, parental feed, etc. Staff will also be informed how to review a custom date.

Who is responsible: monitoring and escalation?

Trained Nurses

- Identify patients who need fluid balance monitoring and communicate via handover
- Clarify up-to-date plan with medical team and communicate to patient and visitors, wider MDT including HCAs: Speech and Language Therapists, housekeeping, physio and any colleague who may assist with, provide or remove fluids
- Ensure accuracy using documentation
- Escalate promptly to medical team in case of developing imbalance, deterioration or concern

HCA's and Student Nurses

- Teamwork, Communicating with MDT to ensure accurate measurements – e.g. SALT, housekeeping, physio etc.
- Ensure fluid balance documentation is complete.
- Inform trained staff or nurse in charge with clinical deterioration or concerns

Doctors

- Daily review: Indication for monitoring, is it still necessary?
  Goal – document with special instructions such as restrictions or frequency of monitoring
  Escalation plan or the need for it

FY1's – Must escalate concerns to a senior if not resolved within 4 hours

Indications for fluid balance monitoring

Monitoring fluid balance helps monitor acute illness and early recognition of further deterioration.

Fluid balance documentation must be completed for the following patients unless a decision has been made otherwise by a medical/surgical team, senior registered nurse or outreach:

Acute illness

- Sepsis
- Bowel obstruction
- Acute pancreatitis (or acute on chronic)
- Liver failure
- Malnutrition
- Cardiac failure
- Acute Kidney Injury (AKI)
- Chronic Kidney Disease (CKD)
- NEWS score >3 and/or risk of level 2 or 3 care
- Patients discharged from Critical Care for a minimum of 48 hours post transfer or as indicated by outreach or medical/ surgical team.
- Increased 'insensible losses' - sweating, sustained temperature greater than 38 °C or sustained increased respiratory rate

Increased Fluid Output

- High urine output – polyuria -↑200mls /hr – leads to dehydration if unmanaged. Common causes: diabetes, resolving AKI, excessive diuretics.
- Urinary catheter, convene, urostomy or irrigation – volumes must be measured. (Incontinent patients may self-limit input in attempt to manage problem.)
- Diarrhoea and vomiting –at risk of dehydration, malnutrition and significant electrolyte disturbances including hyperkalaemia.
- Excessive nasogastric aspiration/drainage.
- High output stoma/ ileostomy (increased frequency or ↑1 litre in 24 hrs).
- Post-operative patients - excessive fluid loss from surgical drains/ cavity drains, wounds /VAC therapy.

Decreased Oral Intake

- Intravenous Fluids and medications / or parenteral nutrition
- NBM >6 hours/restricted diets
- Diagnosis or at risk of malnutrition
- Enteral feeding i.e. PEG, NG, PEG-J, NJ
- Unconscious patients
- Impaired swallow
- Over 75 year olds

Reduced Urine Output

- Oliguria – low urine output ↓0.5mls per kilogram per hour. Oliguria can be an early sign of poor renal perfusion. Most common causes: hypotension or hypovolaemia.

- Anuria - absence of urine: ↓100mls over 24 hours.

- Acute Kidney Injury (AKI) /Chronic Kidney Disease Patients with raised creatinine blood levels combined with a low urine output may have an AKI: the kidneys are not effectively filtering blood, reabsorbing vital elements and excreting others. Prompt identification of an AKI is crucial as it can lead to serious complications if left untreated.

- Medications which increase the risk of AKI (patients on these need fluid balance monitoring):
  - Contrast medium – monitor fluid balance for 24 hrs before and after procedure.
  - Chemotherapy – monitor Fluid Balance during therapy.
  - Antibiotic therapy – many antibiotics can cause renal impairment (Check BNF) including: Gentamycin, Aciclovir and Vancomycin. Fluid balance should be monitored throughout therapy and for 24hrs post last dose.
  - ACE inhibitors and diuretics - often held in acute kidney injury.

Loss of Independence

- Paralysis
- Poor vision
- Delirium
- Dementia
- Stroke
- Poor memory
- Weakened limbs

This is not an exhaustive list and other indications may be deemed necessary by the responsible healthcare professional.

When to review Fluid Balance

- In-line with the patient's clinical condition
- Routinely- ward round
- Emergencies
- NEWS Triggers
- Cause for concern: Low urine output, High urine output, no IV and patient NBM for 6 hours, deterioration ('When to review a patient's fluid status', appendix 2)
- Review previous day's balance at the start of the shift
- Review at beginning, middle and end of shift or as often as required
- 'When to review a patient's fluid status' flow chart, Appendix 1

When to stop a Fluid Balance Chart

- Reason for commencement has resolved
- End of Life Care

Stopping fluid balance is the decision of a senior clinician or sister/charge nurse. Patients must be assessed thoroughly before discontinuation.

Correct Documentation

Clinicians are reliant on accurate 24 hour totals to inform clinical decisions in relation to fluid management including the prescription of intravenous fluids. This will prevent the serious complications associated with over or under hydration.

Incorrect or poorly completed fluid balance charts and ineffective monitoring can result in detrimental effects on patient outcomes.

- Parameters must be completed to gather accurate balance.
- Always include IV drug volume as this can accumulate to large volumes.
- All fluid loss should be accounted for with as much accuracy as possible.
- Incontinence pads **MUST** be weighed, (appendix 2)
- Escalate any causes of concern over fluid balance
- Assess patient if there is a cause for concern using A-E assessment.

References

Marieb, E.N. & Hoehn, K. (2018) *Human Anatomy and Physiology*, 11th edn. San Francisco: Pearson.

National Institute for Health and Care Excellence (NICE) (2013) *Intravenous fluid therapy in adults in hospital. Clinical Guideline* [Online] Retrieved from: https://www.nice.org.uk/guidance/cg174

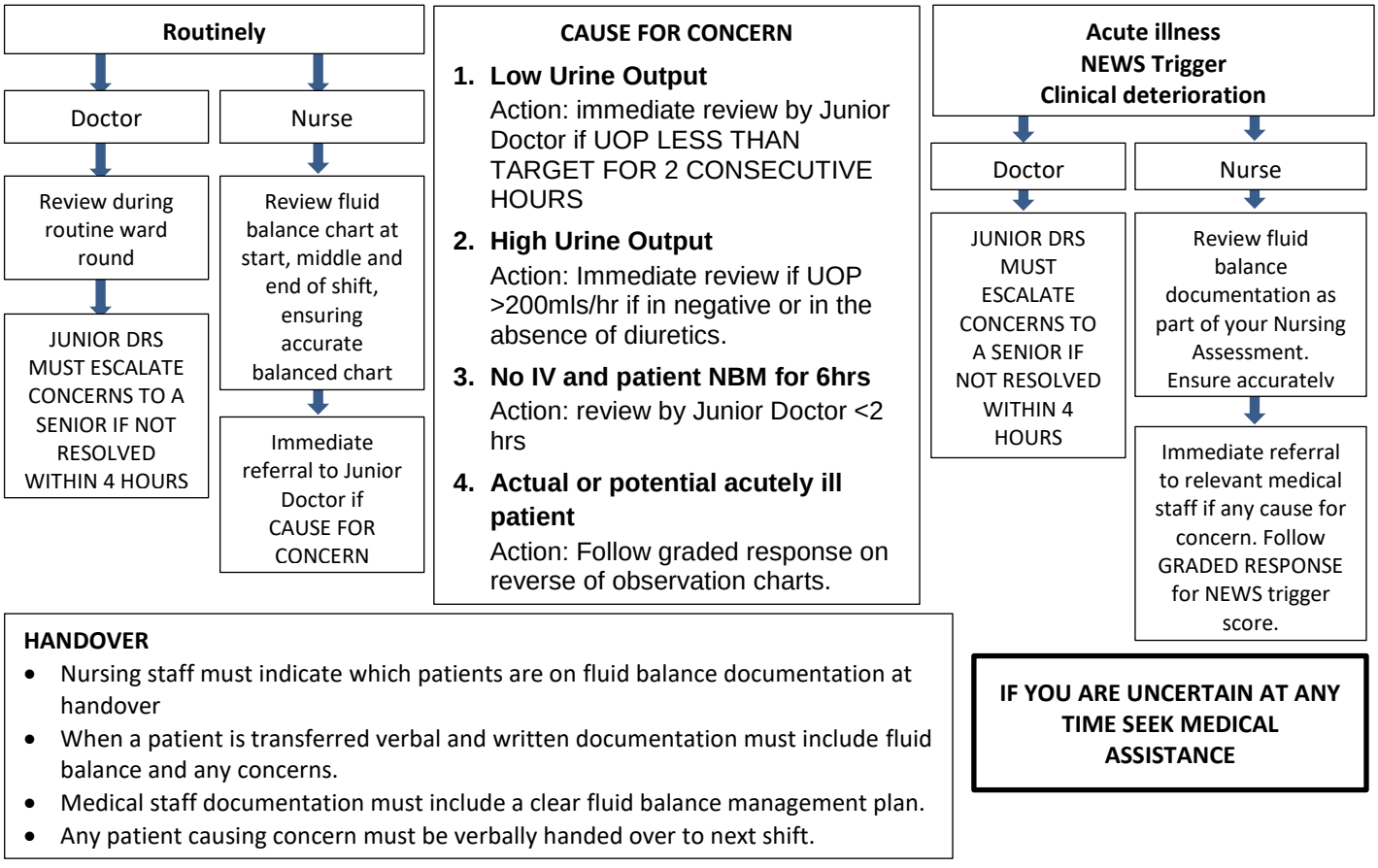
Nursing & Midwifery Council (NMC) (2018) *The code: Professional standards of practice and behaviour for nurses, midwives and nursing associates*. Retrieved from http://www.nmc.org.uk/globalassets/sitedocuments/nmc-publications/revised-new-nmc-code.pdf

Shepherd, A (2011) Measuring and managing fluid balance. *Nursing Times*; 107: 28, early online publication.

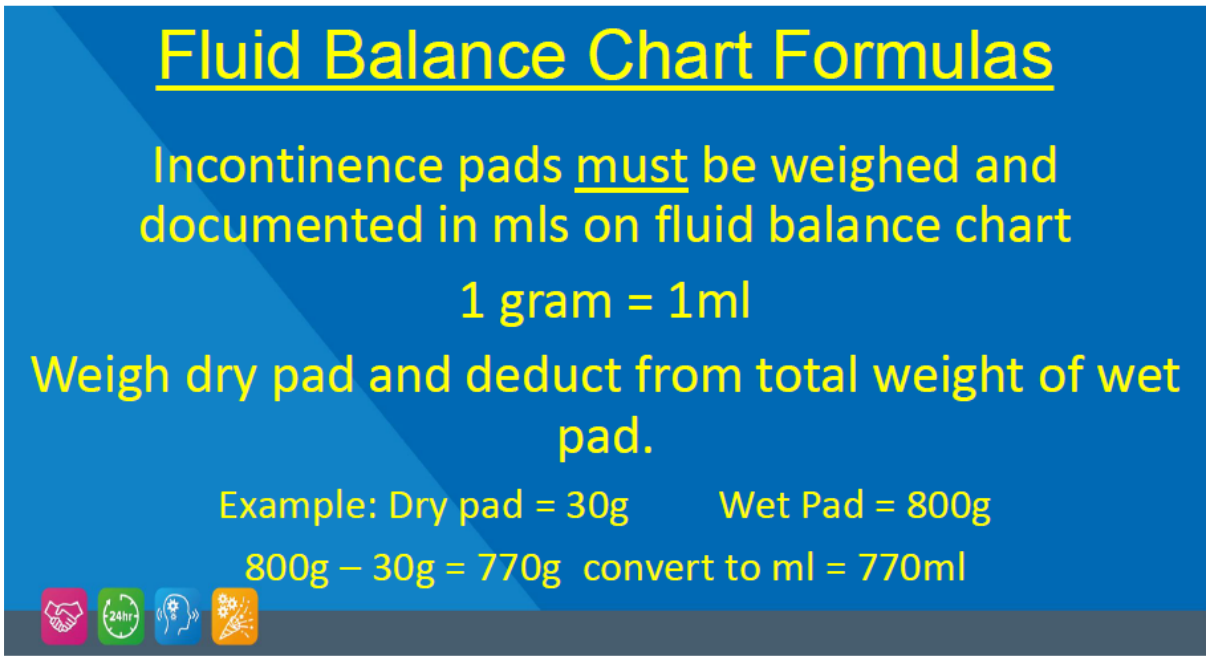
The Royal Marsden NHS Foundation Trust. (2020) The royal marsden manual of clinical and cancer nursing procedures. Fluid Balance Chapter 8 [Online] Retrieved from: https://www.rmmonline.co.uk/manual/c08-sec-0005

Appendix 1

When to review the patient's fluid status (adapted from Central Manchester University Hospitals)



Appendix 2


Putting Patients First
4ward
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Acute Hospitals
NHS Trust
Fluid Balance Chart Formulas
Incontinence pads must be weighed and documented in mls on fluid balance chart
1 gram = 1ml
Weigh dry pad and deduct from total weight of wet pad.
Example: Dry pad = 30g Wet Pad = 800g
800g – 30g = 770g convert to ml = 770ml

Monitoring

Page/ Section of Key Document	Key control:	Checks to be carried out to confirm compliance with the Policy:	How often the check will be carried out:	Responsible for carrying out the check:	Results of check reported to: *(Responsible for also ensuring actions are developed to address any areas of non-compliance)*	Frequency of reporting:
	WHAT?	**HOW?**	**WHEN?**	**WHO?**	**WHERE?**	**WHEN?**
	These are the 'key' parts of the process that we are relying on to manage risk. We may not be able to monitor every part of the process, but we MUST monitor the key elements, otherwise we won't know whether we are keeping patients, visitors and/or staff safe.	What are we going to do to make sure the key parts of the process we have identified are being followed? (Some techniques to consider are; audits, spot-checks, analysis of incident trends, monitoring of attendance at training.)	Be realistic. Set achievable frequencies. Use terms such as '10 times a year' instead of 'monthly'.	Who is responsible for the check? Is it listed in the 'duties' section of the Policy? Is it in the job description?	Who will receive the monitoring results? Where this is a committee the committee's specific responsibility for monitoring the process must be described within its terms of reference.	Use terms such as '10 times a year' instead of 'monthly'.
	Completion of Fluid Balance Chart	Audit of completion of Fluid Balance Charts	Quarterly	Professional Development practitioner responsible for Nutrition and Hydration or Nutrition Nurse	Nutrition and Hydration Steering Group	Quarterly until 100% compliant in conjunction with CCG report
	Completion of Fluid Balance e-Learning	Analysis of electronic reporting function on ESR	Quarterly	Professional Development Practitioner responsible for Nutrition and Hydration or Nutrition Nurse	Nutrition and Hydration Steering Group	Quarterly until 100% compliant in conjunction with CCG report

Contribution List

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This key document has been circulated to the following individuals for consultation;

Designation
Andy Fryer, Professional Development and Practice Facilitator Lead Practitioner

This key document has been circulated to the chair(s) of the following committee's / groups for comments;

Committee
Nutrition and Hydration Steering Group

Supporting Document 1 - Equality Impact Assessment Tool

To be completed by the key document author and included as an appendix to key document when submitted to the appropriate committee for consideration and approval.

Please complete assessment form on next page;

Herefordshire & Worcestershire STP - Equality Impact Assessment (EIA) Form
Please read EIA guidelines when completing this form

Section 1 - Name of Organisation (please tick)

Herefordshire & Worcestershire STP		Herefordshire Council		Herefordshire CCG	
Worcestershire Acute Hospitals NHS Trust	x	Worcestershire County Council		Worcestershire CCGs	
Worcestershire Health and Care NHS Trust		Wye Valley NHS Trust		Other (please state)	

Name of Lead for Activity	**Jon Howard**

Details of individuals completing this assessment	**Name**	**Job title**	**e-mail contact**
	Jon Howard	**Professional Development**	**Jonathan.howard2@nhs.net**
Date assessment completed	**24/06/2022**		

Section 2

Activity being assessed (e.g. policy/procedure, document, service redesign, policy, strategy etc.)	**Title: Guideline**			
What is the aim, purpose and/or intended outcomes of this Activity?	Guidance			
Who will be affected by the development & implementation of this activity?	x❑ Service User x❑ Patient x❑ Carers x❑ Visitors		x❑ Staff ❑ Communities ❑ Other _____ ❑	
Is this:	x❑ Review of an existing activity ❑ New activity ❑ Planning to withdraw or reduce a service, activity or presence?			

What information and evidence have you reviewed to help inform this assessment? (Please name sources, eg demographic information for patients / services / staff groups affected, complaints etc.	
Summary of engagement or consultation undertaken (e.g. who and how have you engaged with, or why do you believe this is not required)	
Summary of relevant findings	

Section 3

Please consider the potential impact of this activity (during development & implementation) on each of the equality groups outlined below. **Please tick one or more impact box below for each Equality Group and explain your rationale**. Please note it is possible for the potential impact to be both positive and negative within the same equality group and this should be recorded. Remember to consider the impact on e.g. staff, public, patients, carers etc. in these equality groups.

Equality Group	Potential positive impact	Potential neutral impact	Potential negative impact	Please explain your reasons for any potential positive, neutral or negative impact identified
Age		x		
Disability		x		
Gender Reassignment		x		
Marriage & Civil Partnerships		x		
Pregnancy & Maternity		x		
Race including Traveling Communities		x		
Religion & Belief		x		
Sex		x		
Sexual Orientation		x		
Other Vulnerable and Disadvantaged Groups (e.g. carers; care leavers; homeless; Social/Economic deprivation, travelling communities etc.)		x		

Equality Group	Potential positive impact	Potential neutral impact	Potential negative impact	Please explain your reasons for any potential positive, neutral or negative impact identified
Health Inequalities (any preventable, unfair & unjust differences in health status between groups, populations or individuals that arise from the unequal distribution of social, environmental & economic conditions within societies)		X		

Section 4

What actions will you take to mitigate any potential negative impacts?	Risk identified	Actions required to reduce / eliminate negative impact	Who will lead on the action?	Timeframe
	N/A	.		
How will you monitor these actions?				
When will you review this EIA? (e.g in a service redesign, this EIA should be revisited regularly throughout the design & implementation)				

Section 5 - Please read and agree to the following Equality Statement

1. Equality Statement

1.1. All public bodies have a statutory duty under the Equality Act 2010 to set out arrangements to assess and consult on how their policies and functions impact on the 9 protected characteristics: Age; Disability; Gender Reassignment; Marriage & Civil Partnership; Pregnancy & Maternity; Race; Religion & Belief; Sex; Sexual Orientation

1.2. Our Organisations will challenge discrimination, promote equality, respect human rights, and aims to design and implement services, policies and measures that meet the diverse needs of our service, and population, ensuring that none are placed at a disadvantage over others.

1.3. All staff are expected to deliver services and provide services and care in a manner which respects the individuality of service users, patients, carer's etc, and as such treat them and members of the workforce respectfully, paying due regard to the 9 protected characteristics.

Signature of person completing EIA	
Date signed	
Comments:	
Signature of person the Leader Person for this activity	Jonathan Howard, Professional Development Practitioner
Date signed	04/07/22
Comments:	Approved by Nutrition and Hydration Steering Group

Supporting Document 2 – Financial Impact Assessment

To be completed by the key document author and attached to key document when submitted to the appropriate committee for consideration and approval.

	Title of document:	Yes/No
1.	Does the implementation of this document require any additional Capital resources	NO
2.	Does the implementation of this document require additional revenue	NO
3.	Does the implementation of this document require additional manpower	NO
4.	Does the implementation of this document release any manpower costs through a change in practice	NO
5.	Are there additional staff training costs associated with implementing this document which cannot be delivered through current training programmes or allocated training times for staff	NO
	Other comments:	

If the response to any of the above is yes, please complete a business case and which is signed by your Finance Manager and Directorate Manager for consideration by the Accountable Director before progressing to the relevant committee for approval.