

NATIONAL INSTITUTE FOR HEALTH AND CLINICAL EXCELLENCE

Centre for Clinical Practice

SCOPE

Clinical guideline title: Intravenous fluid therapy in adults in hospital

Quality standard title: Intravenous fluid therapy in adults in hospital

1 Introduction

1.1 *Clinical guidelines*

Clinical guidelines are recommendations by NICE on the appropriate treatment and care of people with specific diseases and conditions within the NHS. They are based on the best available evidence.

This scope defines what the guideline will (and will not) examine, and what the guideline developers will consider. The scope is based on the referral from the Department of Health.

1.2 *Quality standards*

Quality standards are a set of specific, concise quality statements and measures that act as markers of high-quality, cost-effective patient care, covering the treatment and prevention of different diseases and conditions.

For this topic a NICE quality standard will be produced based on the guideline development recommendations. The clinical guideline and the quality standard will be published at the same time.

This scope defines the areas of care for which specific quality statements and measures will (and will not) be developed.

The guideline and quality standard development processes are described in detail on the NICE website (see section 7).

2 Need for guidance

2.1 *Epidemiology*

- a) Correct fluid and electrolyte balance is essential to maintain normal physiological function. Hospitalised patients may not be able to eat and drink normally and often have depleted fluid and/or electrolyte levels. Intravenous provision of fluid and electrolytes is therefore often needed to maintain or restore balance.
- b) Intravenous fluid and electrolyte therapy may also be needed to correct and maintain imbalances from losses of blood cells, plasma, water or electrolytes beyond the normal losses in urine, stool and sweat. Causes of abnormal losses include blood loss; plasma or fluid loss from burns; fluid loss from diarrhoea, vomiting or surgical drains; and abnormal leakage of fluid from the circulation into the interstitial space.
- c) There are many issues to consider when prescribing intravenous fluids and electrolytes. It is imperative that the amount and type is correct for the patient. Inadequate fluid provision can lead to hypovolaemia and poor organ perfusion, and excessive provision can result in hypervolaemia, oedema and heart failure. Under or over provision of electrolytes can also lead to potentially serious disturbances of intracellular or extracellular electrolyte balance, particularly in patients with reduced kidney or liver function.
- d) Intravenous fluid therapy cuts across many medical and surgical disciplines. Inappropriate fluid therapy is rarely documented as being responsible for patient harm, but it is widely accepted that errors in prescribing, leading to insufficient or excessive provision of intravenous fluids or electrolytes, are common and have adverse effects on patient morbidity and mortality.

- e) These prescribing errors are particularly likely to arise in accident and emergency departments, acute admission units and general ward areas, where initiation and prescription of intravenous fluids may be undertaken by less expert staff. In higher dependency and critical care units more expertise is available, and fluid and electrolyte status can be more closely monitored.
- f) The 1999 UK National Confidential Enquiry into Perioperative Deaths (NCEPOD) emphasises that fluid imbalance led to serious postoperative morbidity and mortality. The report estimated that 20% of patients studied had either poorly documented fluid balance or unrecognised and untreated fluid imbalance. It is likely that similar problems exist in other branches of hospital practice.

2.2 Current practice

- a) Many prescribers do not know the constituents of the many different types of fluids used in intravenous replacement therapy, and many intravenous fluid prescriptions provide too little or too much fluid and electrolytes to restore and maintain balance. There is little formal education or training in intravenous fluid prescription, which may lead to incorrect prescribing.
- b) There is a wide variation in the type of charts used to record fluid and electrolyte status in practice. Monitoring of patients is often suboptimal, with fluid and electrolyte status not being recorded accurately. Changes to patients' requirements are often not assessed. There is often insufficient attention by clinical staff to ensure that appropriate identification, treatment and monitoring is maintained.
- c) There is considerable debate about the efficacy of some specialised intravenous fluids in seriously ill patients, and consequent variation in clinical practice.

- d) There is a need for a standardised approach to the clinical assessment of patients and the prescription of intravenous fluid therapy in the NHS. This guidance represents a major opportunity to improve patient safety.

3 Clinical guideline

3.1 Population

3.1.1 Groups that will be covered

- a) Adults (16 years and older) in hospital.
- b) Medical and surgical (pre- and postoperative) patients, including subspecialties not specifically excluded in section 3.1.2.
- c) Patients with sepsis.
- d) Patients with acute kidney injury who do not need renal replacement therapy.
- e) Specific consideration will be given to the particular needs of:
- older people, who have particular challenges in managing fluid balance
 - specific religious groups, in relation to choice of fluid
 - any other groups shown to have particular clinical needs.

3.1.2 Groups that will not be covered

- a) People younger than 16 years.
- b) Pregnant women.
- c) Patients with established severe renal (stage 4 or 5 chronic kidney disease) or liver disease (Childs Pugh C score in liver disease).
- d) Patients with diabetes, including those with diabetic ketoacidosis and hyperosmolar states.

- e) Patients needing inotropes to support their circulation.
- f) Patients with burns.
- g) Patients with traumatic brain injury or needing neurosurgery.

3.2 *Healthcare settings*

- a) NHS hospitals.

3.3 *Management*

3.3.1 Key issues that will be covered

- a) Training and education in prescribing intravenous fluid therapy in hospitals.
- b) Clinical and laboratory assessment, including:
 - fluid and electrolyte requirements
 - current fluid and electrolyte status
 - current prescriptions of intravenous fluids and electrolytes, including administration fluids associated with intravenous drugs
 - current prescriptions of other medications influencing fluid and electrolyte status.
- c) Types and amount of fluids and electrolytes to restore fluid balance (resuscitation):
 - crystalloids compared with crystalloids
 - crystalloids compared with colloids
 - colloids compared with colloids.
- d) Type and amount of fluids and electrolytes to maintain fluid balance:
 - crystalloids compared with crystalloids

- e) Types and amount of fluids and electrolytes to replace continuing abnormal fluid losses:
- crystalloids compared with crystalloids
 - crystalloids compared with colloids
 - colloids compared with colloids.
- f) Monitoring and documenting fluid and electrolyte status:
- clinical assessment:
 - physical examination
 - pulse, blood pressure and temperature charts
 - fluid input and output charts
 - laboratory and/or ward-based measurements of plasma or blood sodium, potassium, chloride, urea, creatinine, pH and bicarbonate
 - laboratory and/or ward-based measurements of urinary sodium and potassium.
- g) Specific considerations related to intravenous fluid therapy in patients who have:
- acute kidney injury, up to the point of renal replacement therapy
 - sepsis
 - trauma
 - congestive heart failure.

3.3.2 Key issues that will not be covered

- a) Route of administration and intravenous catheter related issues, such as choice of catheter, placement techniques and catheter-related infection.
- b) Use of blood and blood products, except albumin.
- c) The specific monitoring or prescription of electrolytes, minerals and trace elements other than sodium, potassium and chloride, unless

their status directly influences sodium, potassium or chloride provision (for example, low magnesium preventing correction of hypokalaemia).

- d) Use of inotropes to support circulatory failure.
- e) Invasive monitoring of fluid status, for example in critical care or during surgical anaesthesia.
- f) Ethical issues related to intravenous fluid prescribing at the end of life.

3.4 Main outcomes

- a) Mortality.
- b) Length of stay in hospital.
- c) Adverse events relating to fluid and electrolyte imbalance
- d) Quality of life.

3.5 Economic aspects

Developers will take into account both clinical and cost effectiveness when making recommendations involving a choice between alternative interventions. A review of the economic evidence will be conducted and analyses will be carried out as appropriate. The preferred unit of effectiveness is the quality-adjusted life year (QALY), and the costs considered will usually be only from an NHS and personal social services (PSS) perspective. Further detail on the methods can be found in 'The guidelines manual' (see section 7).

4 Quality standard

Information on the NICE quality standards development process is available on the NICE website, see section 7.

4.1.1 Areas of care from the guideline that will be considered

- a) Training and education.

- b) Assessment.
- c) Treatment and prescribing
- d) Monitoring.
- e) Specific considerations related to intravenous fluid therapy in patients who have:
 - acute kidney injury, up to the point of renal replacement therapy
 - sepsis
 - trauma
 - congestive heart failure

4.1.2 Areas of care that will not be considered

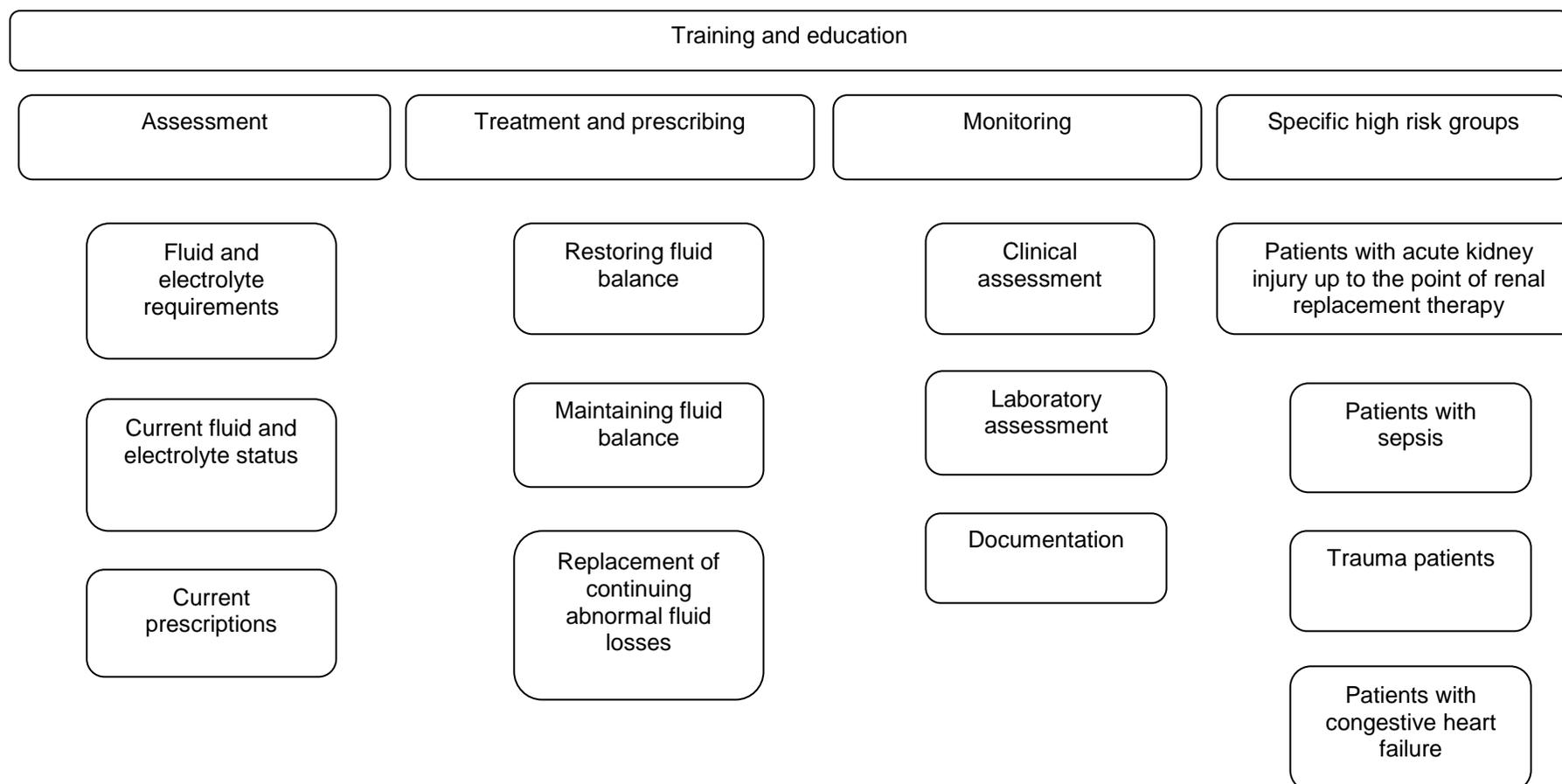
- a) Use of fluids in palliative care
- b) Route of administration and intravenous catheter related issues, such as choice of catheter, placement techniques and catheter-related infection.
- c) Use of blood and blood products, except albumin.
- d) The specific monitoring or prescription of electrolytes, minerals and trace elements other than sodium, potassium and chloride, unless their status directly influences sodium, potassium or chloride provision (for example, low magnesium preventing correction of hypokalaemia).
- e) Use of inotropes to support circulatory failure.
- f) Invasive monitoring of fluid status, for example in critical care or during surgical anaesthesia.
- g) Ethical issues related to intravenous fluid prescribing at the end of life.

4.2 *Economic aspects*

Developers will take into account both clinical and cost effectiveness when prioritising the quality statements to be included in the quality standard. The economic evidence will be considered, and the cost and commissioning impact of implementing the quality standard will be assessed.

5 Mapped areas of care

The diagram below sets out the areas of care that NICE will consider covering in the quality standard. The content of the final quality standard may differ after consultation with stakeholders.



6 Status

6.1 Scope

This is the consultation draft of the scope. The consultation dates are 14 June to 5 July 2011.

6.2 Timings

The development of the guideline recommendations and the quality standard will begin in August 2011.

7 Related NICE guidance

7.1 Published

- Medicines adherence. NICE clinical guideline 76 (2009). Available from www.nice.org.uk/guidance/CG76
- Diabetes in pregnancy. NICE clinical guideline 63 (2008). Available from www.nice.org.uk/guidance/CG63
- Acutely ill patients in hospital. NICE clinical guideline 50 (2007). Available from www.nice.org.uk/guidance/CG50
- Nutrition support in adults. NICE clinical guideline 32 (2006). Available from www.nice.org.uk/guidance/CG32
- Type 1 diabetes in adults. NICE clinical guideline 15 (2004). Available from www.nice.org.uk/guidance/CG15
- Pre-hospital initiation of fluid replacement therapy in trauma. NICE technology appraisal guidance 74 (2004). Available from www.nice.org.uk/guidance/TA74

7.2 NICE guidance under development

NICE is currently developing the following related guidance (details available from the NICE website):

- Patient experience in adult NHS services: improving the experience of care for people using adult NHS services. NICE clinical guideline and quality standard. Publication expected October 2011.

- Acute kidney injury. NICE clinical guideline and quality standard. Publication expected August 2013.

8 Further information

Information on the guideline development process is provided in:

- ‘How NICE clinical guidelines are developed: an overview for stakeholders the public and the NHS’
- ‘The guidelines manual
- ‘Developing NICE quality standards: interim process guide’.

These are available from the NICE website

(www.nice.org.uk/GuidelinesManual and www.nice.org.uk/aboutnice/qualitystandards). Information on the progress of the guideline and quality standard is also available from the NICE website (www.nice.org.uk).