

A suggested gap in nurse training prompted NICE to produce guidance on use of IV fluid therapy aimed at all health professionals providing this therapy

# NICE guidance on giving intravenous fluids

## In this article...

- › Summary of why the NICE guideline is needed
- › Key recommendations from the guideline
- › The five Rs of IV fluid therapy

## 5 key points

**1** IV fluid therapy is often seen as routine, which prevents health professionals from fully appreciating the risks associated with it

**2** There is a lack of formal training in IV fluid therapy

**3** IV fluids can have serious and even fatal consequences if not prescribed and administered correctly

**4** All health professionals involved in IV fluid therapy should undertake training

**5** Every acute setting should identify an IV fluids champion to be responsible for training, clinical governance and audit

Intravenous (IV) fluid therapy is one of the most common treatments provided in acute care each year, thousands of patients receive it.

Despite this, there is often a lack of formal training for nurses and other health professionals, before or after registration, in prescribing and administering and managing this complex therapy. This leads to nurses considering IV fluid therapy as “routine” and often being unaware of its importance, benefits and associated risks.

Greater attention to IV fluid therapy is needed in nurse education and it should be prioritised in continuing professional development. The National Institute for Health and Care Excellence has published a guideline, *Intravenous Therapy in Adults in Hospital*, to improve patient safety in this area (NICE, 2013).

### Improving practice

Although IV fluid therapy is often thought of as routine with few consequences, it carries many risks as well as benefits.

All IV fluids are drugs requiring a prescription, and can have serious negative effects if not given correctly. As many as one in five patients on IV fluid therapy may experience complications as a result of being given too much, too little or the wrong type of fluid, with some complications proving fatal (National Confidential Enquiry into Perioperative Deaths, 1999).

NICE has called for doctors and nurses to be better educated to help them avoid errors that can lead to serious complications, such as acute kidney injury (AKI), which may be a consequence of receiving too little IV fluid, or heart failure, which may be due to receiving too much fluid. Receiving the wrong type of fluid could

result in an imbalance of electrolytes, which could lead to other potentially life-threatening complications.

There are many competing priorities for mandatory and other specialist training in acute hospitals. Once mandatory and necessary specialist training needs are met, resources to support further specialist training in areas such as IV fluid therapy are limited. Training is generally provided to nursing staff to enable them to give IV medications, including IV fluid therapy, little training is available in acute settings specifically on IV fluid therapy.

The NICE guideline recommends that such training should be developed and made available to all health professionals involved in prescribing, administering and monitoring IV fluid therapy. It should cover the importance of monitoring patients on IV fluid therapy, the need for ongoing assessment and reassessment, and the signs and symptoms that may suggest a complication.

### The five Rs

A key recommendation of the guideline is that all health professionals involved in prescribing IV fluids should use the new “five Rs of IV fluid therapy”:

- › Resuscitation;
- › Routine maintenance;
- › Replacement;
- › Redistribution;
- › Reassessment (Box 1).

Remembering and understanding these five principles will help health professionals to prescribe and manage IV fluid therapy safely and effectively.

NICE has produced four algorithms on different aspects of IV fluid management to aid decisions over whether a patient



Seeing IV therapy as routine may mean that staff do not fully appreciate its risks

## BOX 1. THE FIVE RS OF IV FLUID THERAPY

● **Resuscitation:** this is for patients needing IV fluids urgently to restore circulation to vital organs following loss of plasma in the blood (intravascular volume). This can be caused by excessive external fluid and electrolyte loss as well as bleeding or plasma loss, usually from the gastrointestinal tract, or severe internal losses.

● **Routine maintenance:** patients may need IV fluid therapy because they are unable to maintain normal fluid levels orally or by another enteral route. These patients are otherwise well in terms of fluid and electrolyte balance and are haemodynamically stable. Some patients with routine maintenance requirements

may not be able to eat properly as well as being unable to drink and may therefore need electrolyte supplementation; the maintenance prescription should be adjusted for this. Estimates of routine maintenance requirements are essential for all patients on continuing IV fluid therapy; this is calculated by the patient's weight, oral intake and any other IV input (outlined in the routine maintenance algorithm).

● **Replacement:** this is for patients needing fluids to correct water and/or electrolyte deficits or ongoing abnormal losses, such as high-output ileostomies, diarrhoea or vomiting.

● **Redistribution:** some hospital patients

have complex fluid and electrolyte balance problems, due to the shift – or lack of shift – of fluid between different body compartments. This is seen particularly in those who are septic, otherwise critically ill, following major surgery or with major cardiac, liver or renal comorbidities. Health professionals should consider whether patients need IV fluids for their fluids to be redistributed correctly. Expert help should be sought to manage IV fluid therapy in patients with complex redistribution needs.

● **Reassessment:** health professionals should reassess patients at regular intervals, as part of their monitoring of IV fluid therapy.

needs IV fluid therapy, the type of fluid to be prescribed and the duration of the therapy. The algorithms give step-by-step guides to help health professionals make disciplined decisions.

The guideline also calls on hospitals to identify an IV fluids champion – a nurse, consultant, doctor or pharmacist responsible for IV fluid therapy training, clinical governance and auditing of IV fluid prescribing and patient outcomes. This role will be similar to other champion roles in hospitals, which have worked successfully.

Other recommendations include:

- » Patients should have an IV fluid management plan, which should include details of their fluid and electrolyte prescription over the next 24 hours as part of an ongoing reassessment and monitoring plan;
- » Patients' likely fluid and electrolyte needs should be assessed by their history, for example whether they have had a limited fluid intake, whether they are thirsty, and how much and what type of fluids they have lost. A clinical examination, including assessment of their fluid status, should also be carried out and current medications considered. Clinical monitoring using fluid balance charts and laboratory investigations, such as a full blood count, should be included in the assessment;
- » All patients receiving IV fluids should be monitored regularly. This should initially include at least daily reassessments of fluid status, laboratory values (urea, creatinine and electrolytes) and fluid balance charts, along with weight measurement twice weekly;
- » Crystalloids should be used for patients

who need IV fluid resuscitation. These should contain sodium in the range of 130-154mmol/L, with an initial bolus of 500ml over less than 15 minutes.

Tetrastarches must not be used for fluid resuscitation;

- » Health professionals should consider delivering IV fluids for routine maintenance during daytime hours to promote sleep and wellbeing;
- » Hospitals should establish systems to ensure all health professionals involved in prescribing and delivering IV fluid therapy are trained on the principles covered in the guideline, and formally assessed and reassessed at regular intervals to demonstrate competence;
- » Clear incidents of fluid mismanagement, such as unnecessarily prolonged dehydration or inadvertent fluid overload due to IV fluid therapy, should be reported through critical incident reporting and used to improve training and practice.

Helping patients and their families or carers to make informed decisions about care is a key nursing role. NICE has produced a patient information leaflet alongside the guideline outlining questions that patients, families or carers should ask:

- » Why you have decided I need IV fluid?
- » What does IV fluid therapy involve?
- » How long will I need it for?
- » How will it help me?
- » How long will it take to have an effect?
- » Are there any side-effects? What if I have a reaction during or after it?
- » What if I prefer not to have IV fluid?
- » Why are you carrying out these tests?
- » Will IV fluid therapy affect the medication I'm taking?

- » Who should I speak to if I notice any of the signs and symptoms listed?
- » What if I have problems passing urine?
- » Do I still need IV fluid?

It is important that nurses are confident and knowledgeable about IV fluids and nurses and doctors are able to answer these questions.

### NICE guidelines

This clinical guideline is the most practical guideline ever published by NICE. It contains all four algorithms on one A4 page to help health professionals make disciplined decisions about IV fluid treatment, as well as charts and diagrams to illustrate where patients may be experiencing ongoing losses of fluid and electrolytes.

NICE is developing a quality standard for the NHS on IV fluid therapy. This will be based on the new guideline, and will focus on key areas of care for IV fluid management; it is expected to be published in August this year. **NT**

- The guideline is available for download at: [www.nice.org.uk/CG174](http://www.nice.org.uk/CG174), along with other resources including an audit tool and patient information leaflet

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### Reference

Callum KG et al (1999) *Extremes of Age: the 1999 Report of the National Confidential Enquiry into Perioperative Deaths*. London: NCEPOD. [tinyurl.com/NCEPOD-Perioperative1999](http://tinyurl.com/NCEPOD-Perioperative1999)  
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