

# Intravenous fluid therapy in adults in hospital

Quality standard

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This standard is based on CG174.

This standard should be read in conjunction with QS5, QS15, QS61, QS63, QS76, QS110, QS131 and QS166.

## Quality statements

Statement 1 Hospitals have an intravenous (IV) fluids lead who has overall responsibility for training, clinical governance, audit and review of IV fluid prescribing, and patient outcomes.

Statement 2 Adults receiving IV fluid therapy in hospital are cared for by healthcare professionals competent in assessing patients' fluid and electrolyte needs, prescribing and administering IV fluids, and monitoring patient response.

Statement 3 Adults receiving IV fluid therapy in hospital have an IV fluid management plan, determined by and reviewed by an expert, which includes the fluid and electrolyte prescription over the next 24 hours and arrangements for assessing patients and monitoring their plan.

Statement 4 For adults who receive IV fluid therapy in hospital, clear incidents of fluid mismanagement are reported as critical incidents.

# Quality statement 1: Intravenous fluids lead

## Quality statement

Hospitals have an intravenous (IV) fluids lead who has overall responsibility for training, clinical governance, audit and review of IV fluid prescribing, and patient outcomes.

## Rationale

The IV fluids lead in a hospital can promote best practice, ensuring that healthcare professionals are trained in prescribing and administering IV fluid therapy, and reviewing learning from 'near miss' and critical incident reporting. This leadership role can ensure continuity of care in relation to fluid management through coordination between different hospital departments.

## Quality measures

The following measures can be used to assess the quality of care or service provision specified in the statement. They are examples of how the statement can be measured, and can be adapted and used flexibly.

## Structure

Evidence that hospitals have an IV fluids lead who has overall responsibility for ensuring adequate training, clinical governance, audit and review of IV fluid prescribing, and patient outcomes.

**Data source:** Local data collection.

## What the quality statement means for different audiences

**Service providers** (such as district general hospitals and specialist care centres) ensure that they have an IV fluids lead who has overall responsibility for ensuring adequate training, clinical governance, audit and review of IV fluid prescribing, and patient outcomes.

**Healthcare professionals** who care for adults receiving IV fluid therapy in hospital work in the context of clinical governance arrangements that have an IV fluids lead who has overall responsibility for ensuring adequate training, clinical governance, audit and review of IV fluid prescribing, and patient outcomes.

**Commissioners** ensure that they commission services from hospitals that have an IV fluids lead who has overall responsibility for ensuring adequate training, clinical governance, audit and review of IV fluid prescribing, and patient outcomes.

**Adults receiving IV fluid therapy** are cared for in a hospital that has a person who has overall responsibility for ensuring that they receive safe and effective IV fluid therapy.

## Source guidance

Intravenous fluid therapy in adults in hospital. NICE guideline CG174 (2013, updated 2017), recommendation 1.6.3 (key priority for implementation)

## Definition of terms used in this quality statement

### Responsible IV fluids lead

The IV fluids lead will have overall responsibility, through a leadership role, for the quality of care relating to IV fluid therapy. The IV fluids lead should be somebody in a senior position (such as the chief of medicine or the chief nurse), and may delegate specific functions through normal governance structures. The IV fluids lead is not expected to be the person who delivers the training, clinical governance, audit and review of IV fluid prescribing, and patient outcomes. Those functions can be delegated to professionals who have the necessary specialist knowledge in the hospital. [Expert opinion]

## Training

Training in fluid management should also be embedded in both general and specialty training programmes, with clear curriculum-based teaching objectives and delineation of minimum standards of clinical competency and knowledge for each stage of training and clinical delivery. Recognition and management of the clinical complications of fluid management should also be considered. [[NICE's guideline on intravenous fluid therapy in adults in hospital](#)]

Training in prescribing and administering IV fluids can be supported by the [online e-learning module for NICE's guideline on intravenous fluid therapy in adults in hospital](#). The e-learning module uses interactive activities to support prescribers to safely assess, prescribe for and review adults needing IV fluids. The tool may also be useful for trainee prescribers to enhance their knowledge base before they start prescribing practice.

# Quality statement 2: Healthcare professionals' competencies in hospitals

## Quality statement

Adults receiving intravenous (IV) fluid therapy in hospital are cared for by healthcare professionals competent in assessing patients' fluid and electrolyte needs, prescribing and administering IV fluids, and monitoring patient response.

## Rationale

Fluid assessment, prescription and administration are essential daily tasks in many hospital departments. These are complex responsibilities that entail careful clinical and biochemical assessment, good understanding of the principles of fluid physiology in health and disease, and appropriate supervision and training. Inadequate knowledge, failure to recognise the importance of fluid management in patient care and acting on this issue are major factors in poor fluid management, and poor education, training and supervision are major contributors. Different healthcare professionals will have different skills and competencies, relevant to their roles.

## Quality measures

The following measures can be used to assess the quality of care or service provision specified in the statement. They are examples of how the statement can be measured, and can be adapted and used flexibly.

## Structure

Evidence of local arrangements to ensure that adults receiving IV fluid therapy in hospital are cared for by healthcare professionals who are competent in assessing patients' fluid and electrolyte needs, prescribing and administering IV fluids, and monitoring patient response.

**Data source:** Local data collection.



## Process

a) Proportion of healthcare professionals who are responsible for prescribing IV fluid therapy in hospital who are able to demonstrate competency in prescribing IV fluids.

Numerator – the number of healthcare professionals in the denominator who are able to demonstrate competency in prescribing IV fluids.

Denominator – the number of healthcare professionals who are responsible for prescribing IV fluid therapy in hospital.

**Data source:** Local data collection.

b) Proportion of healthcare professionals who are responsible for administering IV fluid therapy in hospital who are able to demonstrate competency in administering IV fluids.

Numerator – the number of healthcare professionals in the denominator who are able to demonstrate competency in administering IV fluids.

Denominator – the number of healthcare professionals who are responsible for administering IV fluid therapy in hospital.

**Data source:** Local data collection.

c) Proportion of healthcare professionals who are caring for adults on IV fluid therapy who are able to demonstrate competency in monitoring patient response.

Numerator – the number of healthcare professionals in the denominator who are able to demonstrate competency in monitoring patient response.

Denominator – the number of healthcare professionals who are monitoring adults on IV fluid therapy.

## What the quality statement means for different audiences

**Service providers** (such as district general hospitals and specialist care centres) ensure

that systems are in place to ensure that adults receiving IV fluid therapy in hospital are cared for by a team of healthcare professionals competent in assessing patients' fluid and electrolyte needs, prescribing and administering IV fluids, and monitoring patient response.

**Healthcare professionals** involved in prescribing and delivering IV fluid therapy can demonstrate competence in assessing patients' fluid and electrolyte needs, prescribing and administering IV fluids, and monitoring patient response. Different healthcare professionals will have different skills and competencies, relevant to their roles.

**Commissioners** ensure that they commission services from hospitals that are able to demonstrate that relevant healthcare professionals are competent in assessing patients' fluid and electrolyte needs, prescribing and administering IV fluids, and monitoring patient response. This can be achieved by requiring providers to supply training numbers for staff who have been trained and staff who have been assessed.

**Adults receiving IV fluid therapy in hospital** are cared for by a team of healthcare professionals who have the knowledge and skills to ensure that they receive safe and effective IV fluid therapy.

## Source guidance

Intravenous fluid therapy in adults in hospital. NICE guideline CG174 (2013, updated 2017), recommendations 1.6.1 (key priority for implementation) and 1.6.2

## Definitions of terms used in this quality statement

### Competencies of a team of healthcare professionals

Hospitals should establish systems to ensure that all healthcare professionals involved in prescribing and delivering IV fluid therapy are trained on intravenous therapy principles covered in NICE's guideline on intravenous fluid therapy in adults in hospital, and are then formally assessed and reassessed at regular intervals to demonstrate competence in:

- understanding the physiology of fluid and electrolyte balance in patients with normal physiology and during illness

- assessing patients' fluid and electrolyte needs (the 5 Rs: Resuscitation, Routine maintenance, Replacement, Redistribution and Reassessment)
- assessing the risks, benefits and harms of IV fluids
- prescribing and administering IV fluids
- monitoring the patient response
- evaluating and documenting changes and
- taking appropriate action as required.

Competency needs to be tailored to the professional role, and may vary according to professional roles. For example, competency for senior clinicians will include active involvement in reviewing patients' fluid management plans, providing leadership to the junior team to ensure quality care.

Competency, in the context of this quality statement, includes IV fluid competencies relevant to people who are having total parenteral nutrition (TPN) but not competencies relating to the nutritional element of prescribing. [Adapted from [NICE's guideline on intravenous fluid therapy in adults in hospital](#), recommendation 1.6.1]

Staff competency in prescribing and administering IV fluids can be supported by the [online e-learning module for NICE's guideline on intravenous fluid therapy in adults in hospital](#). The e-learning module uses interactive activities to support prescribers to safely assess, prescribe for and review adults needing intravenous fluids. The tool may also be useful for trainee prescribers to enhance their knowledge base before they start prescribing practice.

# Quality statement 3: Intravenous fluid management plan

## Quality statement

Adults receiving intravenous (IV) fluid therapy in hospital have an IV fluid management plan, determined by and reviewed by an expert, which includes the fluid and electrolyte prescription over the next 24 hours and arrangements for assessing patients and monitoring their plan.

## Rationale

Hospital inpatients may need IV fluid and electrolytes for fluid resuscitation, routine maintenance, replacement of existing deficits or abnormal ongoing losses, or complex issues of fluid redistribution. Patients' needs for IV fluid therapy and their responses to it will vary. Careful monitoring and daily assessment, informed by communication between the expert and patients, should therefore be detailed in an IV fluid management plan in the medical record.

## Quality measures

The following measures can be used to assess the quality of care or service provision specified in the statement. They are examples of how the statement can be measured, and can be adapted and used flexibly.

## Structure

Evidence of local arrangements to ensure that adults receiving IV fluid therapy in hospital have an IV fluid management plan, determined by and reviewed by an expert, which includes the fluid and electrolyte prescription for the next 24 hours and arrangements for assessing patients and monitoring their plan.

**Data source:** Local data collection.

## Process

Proportion of adults receiving IV fluid therapy in hospital who had an IV fluid management plan, determined by and reviewed by an expert, which included daily review of the fluid and electrolyte prescription and arrangements for assessing the patient and monitoring their plan.

Numerator – the number of adults in the denominator who had an IV fluid management plan determined by and reviewed by an expert, which included daily review of the fluid and electrolyte prescription and arrangements for assessing the patient and monitoring their plan.

Denominator – the number of adults receiving IV fluid therapy in hospital.

**Data source:** Local data collection.

## What the quality statement means for different audiences

**Service providers** (such as district general hospitals and specialist care centres) ensure that systems are in place for IV fluid management plans to be determined by and reviewed by an expert; plans should include prescriptions over the next 24 hours and arrangements for assessing patients and monitoring their plan.

**Healthcare professionals**, who are responsible for adults who are receiving IV fluid therapy in hospital, ensure that they determine and review an IV fluid management plan, which includes the fluid and electrolyte prescription for the next 24 hours and arrangements for assessing patients and monitoring their plan.

**Commissioners** ensure they commission inpatient services for adults so that IV fluid therapy management plans are determined by and reviewed by an expert and include the fluid and electrolyte prescription for the next 24 hours and arrangements for assessing the patients and monitoring their plan. This can be achieved by auditing hospitals using the IV fluid audit toolkit or by monthly performance monitoring.

**Adults receiving IV fluid therapy in hospital** will know that they have an IV fluid management plan that has been written by and reviewed by an expert. The plan includes

the details of the patient's IV fluid prescription (what is needed over the next 24 hours and how it is to be given), as well as details of the IV fluid therapy assessments and checks that should be carried out over the next 24 hours.

## Source guidance

[Intravenous fluid therapy in adults in hospital. NICE guideline CG174](#) (2013, updated 2017), recommendations 1.1.4, 1.1.6 and 1.2.4 (key priorities for implementation)

## Definitions of terms used in this quality statement

### Intravenous fluid management plan

The IV fluid management plan should outline the fluid and electrolyte prescription over the next 24-hour period. It will cover the type, rate and volume of fluid, and how it is to be given. It will be determined by an expert who prescribes IV fluid therapy. Healthcare professionals should follow the IV fluid therapy algorithms in [NICE's guideline on intravenous fluid therapy in adults in hospital](#).

### Assessment

Assessment of adults who are receiving IV fluid therapy will include response to the IV fluid therapy and specific checks for adverse effects of IV fluid therapy. These are described in [NICE's guideline on intravenous fluid therapy in adults in hospital](#). Assessing and monitoring IV fluid therapy will involve clinical judgement supported by laboratory results.

### Monitoring of the plan

The IV fluid management plan should be monitored and reviewed within appropriate timescales. Initially, it should be reviewed daily by an expert. IV fluid management plans for patients on longer-term IV fluid therapy whose condition is stable may be reviewed less frequently. Any decisions to reduce monitoring frequency should be detailed in the IV fluid management plan. [Adapted from [NICE's guideline on intravenous fluid therapy in adults in hospital](#), recommendations 1.1.4, 1.1.6, 1.1.8 and 1.2.4]

## Expert

NICE's guideline on intravenous fluid therapy in adults in hospital defines an expert, in this context, as 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-at-night team or a specialist trainee in an acute medical or surgical specialty.

# Quality statement 4: Identifying and reporting consequences of fluid mismanagement

## Quality statement

For adults who receive intravenous (IV) fluid therapy in hospital, clear incidents of fluid mismanagement are reported as critical incidents.

## Rationale

There are a number of potential adverse consequences of IV fluid therapy, including unnecessarily prolonged dehydration, over hydration or significant electrolyte imbalance, which may be identified by clinical and biochemical monitoring. Not all adverse consequences of IV fluid therapy are due to fluid mismanagement, but clinically significant problems caused by IV fluid mismanagement should be reported as critical incidents. By routinely reporting these events, even when they are well-managed, hospitals will increase learning, improving the likelihood of better patient outcomes.

## Quality measures

The following measures can be used to assess the quality of care or service provision specified in the statement. They are examples of how the statement can be measured, and can be adapted and used flexibly.

## Structure

Evidence of local arrangements to ensure that clear incidents of fluid mismanagement are reported as critical incidents for adults receiving IV fluid therapy in hospital.

**Data source:** Local data collection.



## Process

Proportion of clear incidents of fluid mismanagement recorded for adults receiving IV fluid therapy in hospital that are reported as critical incidents.

Numerator – the number of clear incidents of fluid mismanagement in the denominator for which a critical incident is reported.

Denominator – the number of clear incidents of fluid mismanagement recorded for adults receiving IV fluid therapy in hospital.

**Data source:** Local data collection.

## What the quality statement means for different audiences

**Service providers** (such as district general hospitals and specialist care centres) ensure that systems are in place for reporting clear incidents of fluid mismanagement as critical incidents.

**Healthcare professionals** who care for adults receiving IV fluid therapy in hospital should assess patients' responses to IV fluid therapy and report clear incidents of fluid mismanagement as critical incidents.

**Commissioners** ensure that they commission services for adults receiving IV fluid therapy in hospital from providers that report clear incidents of fluid mismanagement as critical incidents. This can be achieved by ensuring that providers share lessons learned from critical incident investigations.

**Adults receiving IV fluid therapy in hospital** are cared for in a hospital that has systems set in place so that IV fluid therapy problems (for example, patients not getting enough IV fluid and becoming severely dehydrated) are reported and dealt with correctly.

## Source guidance

[Intravenous fluid therapy in adults in hospital. NICE guideline CG174 \(2013, updated 2017\), recommendations 1.2.6 \(key priorities for implementation\)](#)

## Definitions of terms used in this quality statement

### Clear incidents of fluid mismanagement

The identification and reporting of incidents of fluid mismanagement should be good practice. It is better to identify and report such incidents than not to identify them, or not to report them if they are identified. Therefore, implementing the quality standard may see an initial increase in incident reporting, reflecting improved identification and reporting rather than worse practice.

Recommendation 1.2.6 (key priority for implementation) in [NICE's guideline on intravenous fluid therapy in adults in hospital](#) provides the following framework for identifying and reporting adverse consequences in the context of IV fluid management based on Guideline Development Group consensus:

### Consequences of fluid mismanagement to be reported as critical incidents

Consequence of fluid mismanagement	Identifying features	Time frame of identification
Hypovolaemia	<p>Patient's fluid needs not met by oral, enteral or IV intake <b>and</b></p> <ul style="list-style-type: none"> <li>• Features of dehydration on clinical examination</li> <li>• Low urine output or concentrated urine</li> <li>• Biochemical indicators, such as more than 50% increase in urea or creatinine with no other identifiable cause</li> </ul>	Before and during IV fluid therapy
Pulmonary oedema (breathlessness during infusion)	<ul style="list-style-type: none"> <li>• No other obvious cause identified (for example, pneumonia, pulmonary embolus or asthma)</li> <li>• Features of pulmonary oedema on clinical examination</li> <li>• Features of pulmonary oedema on X-ray</li> </ul>	During IV fluid therapy or within 6 hours of stopping IV fluids

Consequence of fluid mismanagement	Identifying features	Time frame of identification
Hyponatraemia	<ul style="list-style-type: none"> <li>• Serum sodium less than 130 mmol/l</li> <li>• No other likely cause of hyponatraemia identified</li> </ul>	During IV fluid therapy or within 24 hours of stopping IV fluids
Hypernatraemia	<ul style="list-style-type: none"> <li>• Serum sodium 155 mmol/l or more</li> <li>• Baseline sodium normal or low</li> <li>• IV fluid regimen included 0.9% sodium chloride</li> <li>• No other likely cause of hypernatraemia identified</li> </ul>	During IV fluid therapy or within 24 hours of stopping IV fluids
Peripheral oedema	<ul style="list-style-type: none"> <li>• Pitting oedema in extremities and/or lumbar sacral area</li> <li>• No other obvious cause identified (for example, nephrotic syndrome or known cardiac failure)</li> </ul>	During IV fluid therapy or within 24 hours of stopping IV fluids
Hyperkalaemia	<ul style="list-style-type: none"> <li>• Serum potassium more than 5.5 mmol/l</li> <li>• No other obvious cause identified</li> </ul>	During IV fluid therapy or within 24 hours of stopping IV fluids
Hypokalaemia	<ul style="list-style-type: none"> <li>• Serum potassium less than 3.0 mmol/l likely to be due to infusion of fluids without adequate potassium provision</li> <li>• No other obvious cause (for example, potassium-wasting diuretics, refeeding syndrome)</li> </ul>	During IV fluid therapy or within 24 hours of stopping IV fluids

## About this quality standard

NICE quality standards describe high-priority areas for quality improvement in a defined care or service area. Each standard consists of a prioritised set of specific, concise and measurable statements. NICE quality standards draw on existing NICE or NICE-accredited guidance that provides an underpinning, comprehensive set of recommendations, and are designed to support the measurement of improvement.

Expected levels of achievement for quality measures are not specified. Quality standards are intended to drive up the quality of care, and so achievement levels of 100% should be aspired to (or 0% if the quality statement states that something should not be done). However, this may not always be appropriate in practice. Taking account of safety, shared decision-making, choice and professional judgement, desired levels of achievement should be defined locally.

Information about [how NICE quality standards are developed](#) is available from the NICE website.

See our [webpage on quality standards advisory committees](#) for details about our standing committees. Information about the topic experts invited to join the standing members is available from the [webpage for this quality standard](#).

NICE has produced a [quality standard service improvement template](#) to help providers make an initial assessment of their service compared with a selection of quality statements. This tool is updated monthly to include new quality standards.

NICE guidance and quality standards apply in England and Wales. Decisions on how they apply in Scotland and Northern Ireland are made by the Scottish government and Northern Ireland Executive. NICE quality standards may include references to organisations or people responsible for commissioning or providing care that may be relevant only to England.

## Diversity, equality and language

Equality issues were considered during development and [equality assessments for this quality standard](#) are available. Any specific issues identified during development of the

quality statements are highlighted in each statement.

Commissioners and providers should aim to achieve the quality standard in their local context, in light of their duties to have due regard to the need to eliminate unlawful discrimination, advance equality of opportunity and foster good relations. Nothing in this quality standard should be interpreted in a way that would be inconsistent with compliance with those duties.

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## Endorsing organisation

This quality standard has been endorsed by NHS England, as required by the Health and Social Care Act (2012)

## Supporting organisations

Many organisations share NICE's commitment to quality improvement using evidence-based guidance. The following supporting organisations have recognised the benefit of the quality standard in improving care for patients, carers, service users and members of the public. They have agreed to work with NICE to ensure that those commissioning or providing services are made aware of and encouraged to use the quality standard.

- [ICUsteps](#)
- [Royal College of Nursing \(RCN\)](#)
- [UK Clinical Pharmacy Association \(UKCPA\)](#)