NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE

Acute kidney injury

NICE quality standard

Draft for consultation

22 December 2014 (first published)

23 March 2023 (expected update publication)

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| **This quality standard covers** preventing, detecting and managing acute kidney injury in adults, young people and children. It describes high-quality care in priority areas for improvement.  This quality standard will update and replace the existing quality standard on acute kidney injury (published December 2014). The topic was identified for update following discussion with NHS England’s Renal Services Transformation Programme and the UK Kidney Association. The discussion identified changes in the priority areas for improvement.  For more information see [update information](http://www.nice.org.uk/guidance/qsXXX/chapter/Update-information).  This is the draft quality standard for consultation (from 21 October to 18 November 2022). The final quality standard is expected to publish in March 2023. |

# Quality statements

[Statement 1](#_Quality_statement_1:) People having a medication review who are at risk of acute kidney injury are given information and advice on maintaining kidney health. **[2014, updated 2023]**

[Statement 2](#_Quality_statement_2:_1) People in hospital who are at risk of acute kidney injury have their serum creatinine level monitored. **[2014, updated 2023]**

[Statement 3](#_Quality_statement_3:) People with an acute kidney injury warning stage 2 or 3 test result have a clinical review within the locally agreed timeframe. **[new 2023]**

[Statement 4](#_Quality_statement_4:) People with acute kidney injury who meet the criteria for renal replacement therapy are referred immediately to a nephrologist or critical care specialist. **[2014]**

[Statement 5](#_Quality_statement_5:) People discharged from hospital after acute kidney injury have a clinical review within 3 months of discharge. **[new 2023]**

In 2023 this quality standard was updated, and statements prioritised in 2014 were updated (2014, updated 2023) or replaced (new 2023). For more information, see [update information](#_Update_information_2).

The [previous version of the quality standard for](http://www.nice.org.uk/guidance/QS76/documents) acute kidney injury is available as a pdf.

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| Questions for consultationQuestions about the quality standard **Question 1** Does this draft quality standard accurately reflect the key areas for quality improvement?  **Question 2** Are local systems and structures in place to collect data for the proposed quality measures? If not, how feasible would it be for these to be put in place?  **Question 3** Do you think each of the statements in this draft quality standard would be achievable by local services given the net resources needed to deliver them? Please describe any resource requirements that you think would be necessary for any statement. Please describe any potential cost savings or opportunities for disinvestment. Questions about the individual quality statements **Question 4** For draft quality statement 1: Will the process measures help to provide a pragmatic focus for quality improvement for this statement? If not, please say why and suggest alternatives.  **Question 5** For draft quality statement 5: The timeframe for this statement is based on the Renal Association guideline and the Royal College of GPs toolkit. Is a maximum timeframe of 3 months appropriate? If not, please suggest an alternative timeframe and identify a source. Local practice case studies **Question 6** Do you have an example from practice of implementing the NICE guideline that underpins this quality standard? If so, please provide details on the comments form. |

# Quality statement 1: Raising awareness in people at risk

## Quality statement

People having a medication review who are at risk of acute kidney injury are given information and advice on maintaining kidney health. **[2014, updated 2023]**

## Rationale

Many people at risk of acute kidney injury are not aware of the potential causes or how to prevent it. Acute kidney injury may be prevented if people are aware of the risks and how to maintain kidney health. Providing information and advice when people who are at risk of acute kidney injury attend a medication review may help to reduce the number of people developing acute kidney injury outside hospital and the number admitted to hospital with the condition.

## Quality measures

The following pragmatic measures are suggested to help 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.

### Process

a) Proportion of people with chronic kidney disease (with an eGFR less than 60 ml/min/1.73 m2), diabetes or heart failure having a medication review who are given information and advice on maintaining kidney health.

Numerator – the number in the denominator who are given information and advice on maintaining kidney health.

Denominator – the number of people with chronic kidney disease (with an eGFR less than 60 ml/min/1.73 m2), diabetes or heart failure having a medication review.

**Data source:** Data can be collected from information recorded locally by healthcare professionals and provider organisations, for example from patient records.

b) Proportion of people prescribed long-term oral non-steroidal anti-inflammatory drugs having a medication review who are given information and advice on maintaining kidney health.

Numerator – the number in the denominator who are given information and advice on maintaining kidney health.

Denominator – the number of people prescribed long-term oral non-steroidal anti-inflammatory drugs (12 prescriptions in the preceding 24 months) having a medication review.

**Data source:** Data can be collected from information recorded locally by healthcare professionals and provider organisations, for example from patient records.

### Outcome

Health-related quality of life for people at risk of acute kidney injury.

**Data source:**Data can be collected from information recorded locally by healthcare professionals and provider organisations, for example, a survey of people at risk of acute kidney injury.

## What the quality statement means for different audiences

**Service providers** (such as GP practices, pharmacies and hospitals) ensure that processes are in place for people who are at risk of acute kidney injury to be given information and advice on maintaining kidney health at medication reviews.

**Healthcare professionals** (such as GPs, pharmacists, nurses and advanced care practitioners) provide information and advice on maintaining kidney health to people at risk of acute kidney injury at medication reviews.

**Commissioners** (integrated care systems) ensure that they commission services that provide information and advice on maintaining kidney health at medication reviews to people at risk of acute kidney injury.

**People who are at risk of acute kidney injury** are given information and advice about how to keep their kidneys healthy when they go to a medication review. This should include explaining possible causes of acute kidney injury (for example, dehydration caused by diarrhoea and vomiting, and certain drugs that can affect the kidneys) and what they can do to avoid it.

## Source guidance

[Acute kidney injury: prevention, detection and management. NICE guideline NG148](https://www.nice.org.uk/guidance/ng148) (2019), recommendation 1.6.4

## Definitions of terms used in this quality statement

### People at risk of acute kidney injury

An increased risk of acute kidney injury is associated with a range of chronic and acute conditions, medicines and social factors as identified in the [NICE clinical knowledge summary](https://cks.nice.org.uk/topics/acute-kidney-injury/): risk factors.

### Information and advice on maintaining kidney health

Healthcare professionals should discuss the potential causes of acute kidney injury and how people at risk can maintain their kidney health. The potentially preventable causes of acute kidney injury include conditions leading to dehydration (for example, diarrhoea and vomiting) and drugs that can cause or exacerbate kidney injury (including over‑the‑counter NSAIDs [non‑steroidal anti‑inflammatory drugs]). Healthcare professionals should offer written information such as [Kidney Care UK’s leaflet, At risk of kidney disease? Keeping your kidneys safe](https://www.kidneycareuk.org/order-or-download-booklets/risk-kidney-disease-keeping-your-kidneys-safe/) . [[NICE’s guideline on acute kidney injury](https://www.nice.org.uk/guidance/ng148), recommendation 1.6.4, and [NICE’s clinical knowledge summary on acute kidney injury](https://cks.nice.org.uk/topics/acute-kidney-injury/): prevention of acute kidney injury]

## Equality and diversity considerations

Healthcare professionals should be aware that some groups of people are at higher risk of dehydration because of their reliance on others to maintain adequate fluid intake. This may include young children, frail older people, people with neurological or cognitive impairment or disability, and people with physical disabilities. The risk of acute kidney injury might also increase for people of Muslim faith during periods of fasting if they have other risk factors (for example, if they are taking diuretics).

People should be given information that they can easily access and understand themselves, or with support, so they can communicate effectively with healthcare services. Clear language should be used, and the content and delivery of information should be tailored to individual needs and preferences. It should be accessible to people who do not speak or read English, and it should be culturally appropriate. For people with additional needs related to a disability, impairment or sensory loss, information should be provided as set out in [NHS England's Accessible Information Standard](https://www.england.nhs.uk/ourwork/accessibleinfo/) or the equivalent standards for the devolved nations.

## Question for consultation

Will the process measures help to provide a pragmatic focus for quality improvement for this statement? If not, please say why and suggest alternatives.

# Quality statement 2: Identifying acute kidney injury in people in hospital

## Quality statement

People in hospital who are at risk of acute kidney injury have their serum creatinine level monitored. **[2014, updated 2023]**

## Rationale

Acute kidney injury can be a 'silent' condition with no external signs or symptoms. Kidney function can deteriorate rapidly so identifying people who are at risk and monitoring their clinical condition is important. Early assessment for acute kidney injury in people who are at risk in hospital may prevent delays in treating the condition, leading to improved outcomes. Monitoring serum creatinine levels in people who are likely to need blood tests for other reasons is inexpensive and easy to do with rapidly available results.

## 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.

### Process

Proportion of hospital stays for people at risk of acute kidney injury where serum creatinine level is monitored.

Numerator – the number in the denominator where serum creatinine level is monitored.

Denominator – the number of hospital stays for people at risk of acute kidney injury.

**Data source:** Data can be collected from information recorded locally by healthcare professionals and provider organisations, for example from patient records.

### Outcome

Length of hospital stay with an episode of acute kidney injury.

**Data source:** Data can be collected from information recorded locally by healthcare professionals and provider organisations, for example from patient records. [NHS Digital Hospital episode statistics](https://digital.nhs.uk/data-and-information/data-tools-and-services/data-services/hospital-episode-statistics) includes length of stay.

## What the quality statement means for different audiences

**Service providers** (hospitals) ensure that systems are in place for people in hospital who are at risk of acute kidney injury to have their serum creatinine level monitored.

**Healthcare professionals** (such as doctors, nurses and pharmacists) monitor the serum creatinine level in people in hospital who are at risk of acute kidney injury.

**Commissioners** (integrated care systems) ensure that they commission services that monitor the serum creatinine level in people in hospital who are at risk of acute kidney injury.

**People in hospital who are at risk of acute kidney injury** have tests to measure the amount of creatinine in their blood, which shows how well their kidneys are working. This allows healthcare professionals to take action if any changes are found.

## Source guidance

[Acute kidney injury: prevention, detection and management. NICE guideline NG148](https://www.nice.org.uk/guidance/ng148) (2019), recommendations 1.1.1, 1.1.2 and 1.3.2

## Definitions of terms used in this quality statement

### People in hospital who are at risk of acute kidney injury

Adults in hospital at risk of acute kidney injury include those:

* who have non‑elective admissions
* who have any major planned interventions, such as interventional radiological procedures (including coronary angiography) and grade 3 or grade 4 surgery, neurosurgery or cardiovascular surgery (see [NICE's guideline on routine preoperative tests for elective surgery](https://www.nice.org.uk/guidance/ng45) for definitions of surgery grades).

[Expert opinion]

Additionally, people with acute illness in hospital are at risk of acute kidney injury if any of the following are likely or present:

* chronic kidney disease (adults with an estimated glomerular filtration rate [eGFR] less than 60 ml/min/1.73 m2 are at particular risk)
* heart failure
* liver disease
* diabetes
* history of acute kidney injury
* oliguria (urine output less than 0.5 ml/kg/hour)
* young age, neurological or cognitive impairment or disability, which may mean limited access to fluids because of reliance on a parent or carer
* hypovolaemia
* use of drugs that can cause or exacerbate kidney injury (such as non‑steroidal anti‑inflammatory drugs [NSAIDs], aminoglycosides, angiotensin‑converting enzyme [ACE] inhibitors, angiotensin II receptor antagonists [ARBs] and diuretics) within the past week, especially if hypovolaemic
* use of iodine-based contrast media within the past week (adults)
* symptoms or history of urological obstruction, or conditions that may lead to obstruction
* sepsis
* deteriorating paediatric or adult early warning scores
* age 65 years or over.

Also, there is a risk of acute kidney injury if any of the following are likely or present in children and young people with acute illness:

* severe diarrhoea (children and young people with bloody diarrhoea are at particular risk)
* symptoms or signs of nephritis (such as oedema or haematuria)
* haematological malignancy
* hypotension.

[[NICE’s guideline on acute kidney injury](https://www.nice.org.uk/guidance/ng148), recommendations 1.1.1 and 1.1.2]

### Monitoring serum creatinine level

Monitor serum creatinine regularly in all adults, children and young people at risk of acute kidney injury. Frequency of monitoring should vary according to clinical need, but daily measurement is typical while in hospital. [[NICE’s guideline on acute kidney injury](https://www.nice.org.uk/guidance/ng148), recommendation 1.3.2]

Clinical laboratories should use creatinine assays that are specific (for example, enzymatic assays) and zero-biased compared with isotope dilution mass spectrometry (IDMS). [[NICE’s guideline on chronic kidney disease](https://www.nice.org.uk/guidance/ng203), recommendation 1.1.2]

Clinical laboratories should detect acute kidney injury, in line with the (p)RIFLE (paediatric Risk, Injury, Failure, Loss, End stage renal disease), AKIN (Acute Kidney Injury Network) or KDIGO (Kidney Disease: Improving Global Outcomes) definitions, by using any of the following criteria:

* a rise in serum creatinine of 26 micromol/litre or greater within 48 hours
* a 50% or greater rise in serum creatinine known or presumed to have occurred within the past 7 days (see also the [NHS England endorsed algorithm for early identification of acute kidney injury](https://www.england.nhs.uk/akiprogramme/aki-algorithm/))
* a fall in urine output to less than 0.5 ml/kg/hour for more than 6 hours in adults and more than 8 hours in children and young people
* a 25% or greater fall in eGFR in children and young people within the past 7 days.

[[NICE’s guideline on acute kidney injury](https://www.nice.org.uk/guidance/ng148), recommendation 1.3.1]

# Quality statement 3: Clinical review following acute kidney injury warning stage 2 or 3 test results

## Quality statement

People with an acute kidney injury warning stage 2 or 3 test result have a clinical review within the locally agreed timeframe. **[new 2023]**

## Rationale

Timely and effective communication of and response to an acute kidney injury warning stage test result will prevent delays in treating the condition and improve outcomes. An acute kidney injury warning stage 2 or 3 test result should prompt a clinical review to determine the management approach. The timing of the review should be tailored to the severity of acute kidney injury and clinical context and in line with locally agreed protocols.

## 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

a) Evidence of locally agreed timeframes and methods for pathology providers to communicate serum creatinine results urgently to primary and secondary care clinicians.

**Data source:** Data can be collected from information recorded locally by healthcare professionals and provider organisations, for example, service protocols.

b) Evidence of locally agreed timeframes and monitoring systems for clinical review following an acute kidney injury warning stage 2 or 3 test result.

**Data source:** Data can be collected from information recorded locally by healthcare professionals and provider organisations, for example, service protocols and monitoring systems.

### Process

The timescales included in these measures are dependent on timely communication of acute kidney injury warning stage test results to clinicians responsible for follow-up.

a) Proportion of acute kidney injury warning stage 2 or 3 test results for people in secondary care that are followed up by a clinical review within 6 hours of the result.

Numerator – the number in the denominator that are followed up by a clinical review within 6 hours.

Denominator – the number of acute kidney injury warning stage 2 or 3 test results for people in secondary care.

**Data source:** Data can be collected from information recorded locally by healthcare professionals and provider organisations, for example from patient records or local monitoring systems.

b) Proportion of acute kidney injury warning stage 2 test results for people with a low pre-test probability of acute kidney injury (stable clinical context) in primary care that are followed up by a clinical review within 24 hours of the result.

Numerator – the number in the denominator that are followed up by a clinical review within 24 hours of the result.

Denominator – the number of acute kidney injury warning stage 2 test results for people with a low pre-test probability of acute kidney injury (stable clinical context) in primary care.

**Data source:** Data can be collected from information recorded locally by healthcare professionals and provider organisations, for example from patient records or local monitoring systems.

c) Proportion of acute kidney injury warning stage 2 test results for people with a high pre-test probability of acute kidney injury (in the context of acute illness) in primary care that are followed up by a clinical review within 6 hours of the result.

Numerator – the number in the denominator that are followed up by a clinical review within 6 hours of the result.

Denominator – the number of acute kidney injury warning stage 2 test results for people with a high pre-test probability of acute kidney injury (in the context of acute illness) in primary care.

**Data source:** Data can be collected from information recorded locally by healthcare professionals and provider organisations, for example from patient records or local monitoring systems.

d) Proportion of acute kidney injury warning stage 3 test results for people with a low pre-test probability of acute kidney injury (stable clinical context) in primary care that are followed up by a clinical review within 6 hours of the result.

Numerator – the number in the denominator that are followed up by a clinical review within 6 hours of the result.

Denominator – the number of acute kidney injury warning stage 3 test results for people with a low pre-test probability of acute kidney injury (stable clinical context) in primary care.

**Data source:** Data can be collected from information recorded locally by healthcare professionals and provider organisations, for example from patient records or local monitoring systems.

e) Proportion of acute kidney injury warning stage 3 test results for people with a high pre-test probability of acute kidney injury (in the context of acute illness) in primary care that are followed up by immediate hospital admission.

Numerator – the number in the denominator that are followed up by immediate hospital admission.

Denominator – the number of acute kidney injury warning stage 3 test results for people with a high pre-test probability of acute kidney injury (in the context of acute illness) in primary care.

**Data source:** Data can be collected from information recorded locally by healthcare professionals and provider organisations, for example from patient records or local monitoring systems.

### Outcome

a) Progression of acute kidney injury.

**Data source:**[UK Renal Registry data portal](https://ukkidney.org/audit-research/data-portals) includes the number of acute kidney injury episodes by stage at start and end of episode.

b) Mortality associated with acute kidney injury.

**Data source:**[Mortality statistics from the Office for National Statistics](https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths).

## What the quality statement means for different audiences

**Service providers** (such as laboratories, hospitals, GP practices and community pharmacists) ensure that timeframes are agreed for communication and follow up of acute kidney injury warning stage 2 or 3 test results. Providers ensure systems are in place for people with an acute kidney injury warning stage 2 or 3 test result to have a clinical review within the locally agreed timeframe.

**Healthcare professionals** (such as doctors, pharmacists and nurses) carry out clinical reviews for people with an acute kidney injury warning stage 2 or 3 test result within the locally agreed timeframe.

**Commissioners** (integrated care systems) ensure that the services they commission have agreed timeframes for communication and follow up of acute kidney injury warning stage 2 or 3 test results, with systems in place for people with an acute kidney injury warning stage 2 or 3 test result to have a clinical review.

**People with an acute kidney injury warning stage 2 or 3 test result** are seen by a healthcare professional urgently for further assessment and to plan how to manage their condition.

## Source guidance

* [Acute kidney injury toolkit. Royal College of GPs](https://elearning.rcgp.org.uk/course/view.php?id=537) [accessed October 2022]
* [Acute kidney injury. NICE clinical knowledge summary](https://cks.nice.org.uk/topics/acute-kidney-injury/) (2021), diagnosis: responding to AKI warning stage test results
* [Acute kidney injury. Renal Association clinical practice guideline](https://ukkidney.org/health-professionals/guidelines/guidelines-commentaries) (2019), guideline 5.1 and audit measures 12 to 14
* [Acute kidney injury. Think Kidneys best practice guidance: Responding to AKI warning stage test results for adults in primary care](https://www.thinkkidneys.nhs.uk/aki/resources/primary-care/) (2018)

## Definitions of terms used in this quality statement

### Acute kidney injury (AKI) warning stage 2 or 3 test result

NHS England has endorsed a [national acute kidney injury algorithm](https://www.england.nhs.uk/akiprogramme/aki-algorithm/) which standardises the definition of AKI. When integrated into a Laboratory Information Management System the algorithm identifies potential cases of AKI from laboratory data in real time and produces a test result.

Results reflect severity as follows:

* AKI warning stage 2: current creatinine 2 or more times the baseline level
* AKI warning stage 3: current creatinine 3 or more times the baseline level, or creatinine 1.5 times baseline and more than 354 micromol/litre.

[[NICE’s clinical knowledge summary on acute kidney injury](https://cks.nice.org.uk/topics/acute-kidney-injury/), diagnosis]

### Clinical review

[The Renal Association guideline on acute kidney injury](https://ukkidney.org/health-professionals/guidelines/guidelines-commentaries) audit measures (12 to 14) identify physiological assessment, documented volume assessment and documented medication review as priorities following an AKI warning stage test result in secondary care.

The approach to clinical review in primary care is described in the [Think Kidneys’ resource on responding to AKI warning stage test results in primary care](https://www.thinkkidneys.nhs.uk/aki/think-kidney-publications/).

For specific information on medication review for people with acute kidney injury see the Think Kidneys documents [Acute kidney injury - potentially problematic drugs and actions to take in primary care](https://www.thinkkidneys.nhs.uk/aki/wp-content/uploads/sites/2/2016/07/Primary-Care-Advice-for-medication-review-in-AKI-.pdf) and [Guidelines for medicines optimisation in patients with acute kidney injury](https://www.thinkkidneys.nhs.uk/aki/wp-content/uploads/sites/2/2015/06/Medicines-optimisation-toolkit-for-AKI-FINAL.pdf). Information on dose adjustment in renal impairment is available from the British National Formulary ([BNF](https://bnf.nice.org.uk/)) or the manufacturers' Summary of Product Characteristics (available at [www.medicines.org.uk/emc](http://www.medicines.org.uk/emc)). Seek specialist advice if unsure. [[NICE’s clinical knowledge summary on acute kidney injury](https://cks.nice.org.uk/topics/acute-kidney-injury/), management of acute kidney injury]

### Locally agreed timeframe

Certain clinical features will prompt an earlier clinical review, for example, poor urine output, evidence of hyperkalaemia, previous acute kidney injury, known chronic kidney injury stage 4 or 5 or renal transplant, frailty, chronic disease such as diabetes or heart failure, suspected intrinsic kidney disease or urinary tract obstruction.

[The Renal Association guideline on acute kidney injury](https://ukkidney.org/health-professionals/guidelines/guidelines-commentaries) includes audit measures (12 to 14) for physiological assessment, documented volume assessment and documented medication review for people with AKI stage 2 or 3 within 6 hours of AKI warning stage test result in secondary care.

As a guide in primary care:

* If AKI warning stage 2 and there is a:
  + Low pre-test probability of AKI (stable clinical context), consider clinical review within 24 hours of the result.
  + High pre-test probability of AKI (in the context of acute illness), consider clinical review within 6 hours of the result.
* If AKI warning stage 3 and there is a:
  + Low pre-test probability of AKI (stable clinical context), consider clinical review within 6 hours of the result.
  + High pre-test probability of AKI (in the context of acute illness), consider immediate admission.

[[Think Kidneys best practice guidance on responding to AKI warning stage test results for adults in primary care](https://www.thinkkidneys.nhs.uk/aki/resources/primary-care/), [Royal College of GPs Acute Kidney Injury toolkit](https://elearning.rcgp.org.uk/mod/book/view.php?id=12897&chapterid=551) and [NICE’s clinical knowledge summary on acute kidney injury](https://cks.nice.org.uk/topics/acute-kidney-injury/), diagnosis]

## Equality and diversity considerations

Healthcare professionals should be aware that acute kidney injury is less likely to be identified in young adults under 30 and some minority ethnic groups. A timely and effective response to AKI warning stage 2 or 3 test results will help to improve detection in these groups.

# Quality statement 4: Referral for renal replacement therapy

## Quality statement

People with acute kidney injury who meet the criteria for renal replacement therapy are referred immediately to a nephrologist or critical care specialist. **[2014]**

## Rationale

It is important to ensure that people with acute kidney injury who need renal replacement therapy receive it in the right care setting at the right time, and that delays in access to treatment that put people at risk are avoided. This can be achieved through immediate referral to a nephrologist or critical care specialist, supported by effective referral and transfer protocols that prioritise people with the greatest need. Prompt access to renal replacement therapy offers potential benefits that include preventing further deterioration of renal function, improving chances of renal recovery, shorter hospital stays, lower mortality and better long‑term 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 that there is an agreed inter-hospital transfer standard in place to avoid delays in the transfer of people with acute kidney injury from referring hospitals to renal centres (where required).

**Data source:** Data can be collected from information recorded locally by healthcare professionals and provider organisations, for example from service protocols.

### Process

Proportion of people with acute kidney injury who meet the criteria for renal replacement therapy who are referred immediately to a nephrologist or critical care specialist.

Numerator – the number in the denominator who are referred immediately to a nephrologist or critical care specialist.

Denominator – the number of people with acute kidney injury who meet the criteria for renal replacement therapy.

**Data source:** Data can be collected from information recorded locally by healthcare professionals and provider organisations, for example from patient records. Local areas may wish to add an exclusion for people who are in their last days of life.

### Outcome

a) Time from referral of people with acute kidney injury who meet the criteria for renal replacement therapy to be seen by a nephrologist or critical care specialist.

**Data source:**Data can be collected from information recorded locally by healthcare professionals and provider organisations, for example from patient records.

b) Mortality associated with acute kidney injury.

**Data source:**[Mortality statistics from the Office for National Statistics](https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths).

## What the quality statement means for different audiences

**Service providers** (such as district general hospitals and specialised renal centres) ensure that clear referral pathways and transfer protocols are in place for the immediate referral of people with acute kidney injury who meet the criteria for renal replacement therapy to a nephrologist or critical care specialist.

**Healthcare professionals** (such as doctors) immediately refer people with acute kidney injury who meet the criteria for renal replacement therapy to a nephrologist or critical care specialist and transfer them according to local protocols.

**Commissioners** (integrated care systems and NHS England) ensure that secondary care providers have clear referral pathways and transfer protocols in place for the immediate referral of people with acute kidney injury who meet the criteria for renal replacement therapy to a nephrologist or critical care specialist. Commissioners should work with NHS England when necessary to ensure that there is enough capacity within specialist nephrology teams for referrals.

**People with acute kidney injury who need renal replacement therapy (such as dialysis)** are referred immediately to specialist services so that delays in having the treatment are avoided**.**

## Source guidance

[Acute kidney injury: prevention, detection and management. NICE guideline NG148](https://www.nice.org.uk/guidance/ng148) (2019), recommendations 1.5.8 and 1.5.11

## Definitions of terms used in this quality statement

### People with acute kidney injury

## Acute kidney injury is detected in line with the (p)RIFLE (risk, injury, failure, loss, end stage renal disease, paediatric classification), AKIN (Acute Kidney Injury Network) or KDIGO (Kidney Disease: Improving Global Outcomes) definitions, by using any of the following criteria:

* a rise in serum creatinine of 26 micromol/litre or greater within 48 hours
* a 50% or greater rise in serum creatinine known or presumed to have occurred within the past 7 days
* a fall in urine output to less than 0.5 ml/kg/hour for more than 6 hours in adults and more than 8 hours in children and young people
* a 25% or greater fall in estimated glomerular filtration rate (eGFR) in children and young people within the past 7 days.

## [[NICE's guideline on acute kidney injury](https://www.nice.org.uk/guidance/ng148), recommendation 1.3.1]

An [NHS England endorsed algorithm for acute kidney injury](https://www.england.nhs.uk/akiprogramme/aki-algorithm/) standardises the definition of acute kidney injury.

### Criteria for renal replacement therapy

If any of the following are not responding to medical management:

* hyperkalaemia
* metabolic acidosis
* symptoms or complications of uraemia (for example, pericarditis or encephalopathy)
* fluid overload
* pulmonary oedema.

[[NICE's guideline on acute kidney injury](https://www.nice.org.uk/guidance/ng148), recommendation 1.5.8]

### Immediate referral

Immediate referral by healthcare professionals is needed to ensure timely initiation of therapy. Effective and timely referral should be made using locally developed referral and transfer protocols. These protocols should be based on [National Early Warning Score (NEWS) 2](https://www.rcplondon.ac.uk/projects/outputs/national-early-warning-score-news-2), to ensure that people who meet the criteria for renal replacement therapy are seen by a suitable specialist and that there is appropriate triage of people with acute kidney injury, including those arriving from other hospitals. [Expert opinion]

# Quality statement 5: Clinical review after hospital discharge

## Quality statement

People discharged from hospital after acute kidney injury have a clinical review within 3 months of discharge. **[new 2023]**

## Rationale

People discharged from hospital after acute kidney injury are at risk of poor outcomes. A follow-up clinical review in primary or secondary care may help improve outcomes and prevent hospital readmission. A co-ordinated follow-up system is needed so that it is clear where the review will take place. The timing of the review should reflect the cause of acute kidney injury, it’s severity and duration, the degree of kidney recovery at discharge and other long-term conditions.

## 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 hospital discharge plans include recommendations on timing and responsibility for clinical review following an episode of acute kidney injury.

**Data source:** Data can be collected from information recorded locally by healthcare professionals and provider organisations, for example, service protocols and discharge plans.

### Process

Proportion of people discharged from hospital after acute kidney injury who have a clinical review within 3 months of discharge.

Numerator – the number in the denominator who have a clinical review within 3 months of discharge.

Denominator – the number of people discharged from hospital after acute kidney injury.

**Data source:** Data can be collected from information recorded locally by healthcare professionals and provider organisations, for example from patient records.

### Outcome

Emergency readmissions to hospital within 90 days of discharge after acute kidney injury.

**Data source:**[NHS Digital’s Hospital Episode Statistics](https://digital.nhs.uk/data-and-information/data-tools-and-services/data-services/hospital-episode-statistics)

## What the quality statement means for different audiences

**Service providers** (hospitals and GP practices) ensure that hospital discharge plans include recommendations on the timing and responsibility for clinical review following an episode of acute kidney injury. Providers ensure that people discharged from hospital after acute kidney injury have a follow-up clinical review within 3 months of discharge.

**Healthcare professionals** (doctors, nurses and pharmacists) carry out clinical reviews for people discharged from hospital after acute kidney injury within 3 months of discharge.

**Commissioners** (integrated care systems) ensure that the services they commission carry out clinical reviews for people discharged from hospital after acute kidney injury within 3 months of discharge.

**People discharged from hospital after acute kidney injury** have a clinical review within 3 months of their discharge to assess their medication, monitor their kidney function and discuss how to maintain their kidney health.

## Source guidance

* [Acute kidney injury. Renal Association clinical practice guideline](https://ukkidney.org/health-professionals/guidelines/guidelines-commentaries) (2019), guideline 10.1
* [Acute kidney injury toolkit. Royal College of GPs](https://elearning.rcgp.org.uk/course/view.php?id=537) [accessed October 2022]

## Definitions of terms used in this quality statement

### People discharged from hospital after acute kidney injury

All people discharged from hospital following an episode of acute kidney injury that occurred during their hospital stay, including those who were admitted to hospital for another reason. [Expert opinion]

### Clinical review

The review should include:

* a medication review, including reviewing the need for long-term medications stopped during an episode of acute kidney injury. For more information see [Think Kidneys’ When or if to restart ACEI, ARB, diuretics and other antihypertensive drugs after an episode of AKI](https://www.thinkkidneys.nhs.uk/aki/wp-content/uploads/sites/2/2016/02/When-to-restart-drugs-stopped-during-AKI-final.pdf)
* initiating ongoing plan for monitoring of kidney function
* providing information and advice on maintaining kidney health.

[[Royal College of GPs Acute Kidney Injury toolkit](https://elearning.rcgp.org.uk/mod/book/view.php?id=12897), post-AKI care and [NICE’s clinical knowledge summary on acute kidney injury](https://cks.nice.org.uk/topics/acute-kidney-injury/), management of acute kidney injury]

### Within 3 months of discharge

The timing of the review should reflect the severity of acute kidney injury, individual risk factors, kidney recovery at the point of hospital discharge and other long-term conditions.

A secondary care nephrology clinical review following acute kidney injury should be arranged:

* within 90 days for those with residual chronic kidney disease stage G4 at hospital discharge
* within 30 days for those with residual chronic kidney disease stage G5 (non-dialysis-requiring) at hospital discharge
* within 30 days for those with ongoing dialysis requirements at the time of hospital discharge.

[[Renal Association guideline on acute kidney injury](https://ukkidney.org/health-professionals/guidelines/guidelines-commentaries), guideline 10.1. See table 1 in the [NICE guideline on chronic kidney disease](https://www.nice.org.uk/guidance/ng203) for details of the classification of chronic kidney disease]

Suggested timescales for general practice clinical review following acute kidney injury are included in the [Royal College of GPs’ Acute Kidney Injury toolkit](https://elearning.rcgp.org.uk/mod/book/view.php?id=12897), post-AKI care, table 3.

## Equality and diversity considerations

People should be given information that they can easily access and understand themselves, or with support, so they can communicate effectively with healthcare services. Clear language should be used, and the content and delivery of information should be tailored to individual needs and preferences. It should be accessible to people who do not speak or read English, and it should be culturally appropriate. For people with additional needs related to a disability, impairment or sensory loss, information should be provided as set out in [NHS England's Accessible Information Standard](https://www.england.nhs.uk/ourwork/accessibleinfo/) or the equivalent standards for the devolved nations.

## Question for consultation

The timeframe for this statement is based on the Renal Association guideline and the Royal College of GPs toolkit. Is a maximum timeframe of 3 months appropriate? If not, please suggest an alternative timeframe and identify a source.

# Update information

**March 2023:** This quality standard was updated, and statements prioritised in 2014 were replaced. The topic was identified for update following discussion with NHS England’s Renal Services Transformation Programme and the UK Kidney Association, which identified changes in the priority areas for improvement.

Statements are marked as:

* **[2014]** if the statement remains unchanged
* **[new 2023]** if the statement covers a new area for quality improvement
* **[2014, updated 2023]** if the statement covers an area for quality improvement included in the 2014 quality standard and has been updated.

The [previous version of the quality standard for](http://www.nice.org.uk/guidance/QS76/documents) acute kidney injury is available as a pdf.

# 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](https://www.nice.org.uk/standards-and-indicators/timeline-developing-quality-standards) is available from the NICE website.

See our [webpage on quality standards advisory committees](http://www.nice.org.uk/Get-Involved/Meetings-in-public/Quality-Standards-Advisory-Committee) 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](https://www.nice.org.uk/guidance/indevelopment/gid-qs10170/documents).

NICE has produced a [quality standard service improvement template](https://www.nice.org.uk/about/what-we-do/into-practice/measuring-the-uptake-of-nice-guidance) 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.

## Resource impact

NICE quality standards should be achievable by local services. The potential resource impact is considered by the quality standards advisory committee, drawing on resource impact work for the source guidance. Organisations are encouraged to use the [resource impact statement for the NICE guideline on acute kidney injury](https://www.nice.org.uk/guidance/ng148/resources) to help estimate local costs.

## Diversity, equality and language

Equality issues were considered during development and [equality assessments for this quality standard](https://www.nice.org.uk/guidance/indevelopment/gid-qs10170/documents) 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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