

NATIONAL INSTITUTE FOR HEALTH AND CLINICAL EXCELLENCE

Draft quality standard for urinary tract infection in infants, children and young people under 16

1 Introduction

Urinary tract infection is a common bacterial infection in infants, children and young people. A urinary tract infection is defined by a combination of clinical features and the presence of bacteria in the urine. Around 1 in 10 girls and 1 in 30 boys will have had a urinary tract infection by the age of 16 years.

Making the diagnosis can be difficult because the presenting symptoms or signs (fever, irritability and vomiting) are non-specific and are commonly seen in many childhood viral illnesses, particularly in younger children. A severe infection can make a child extremely unwell and sometimes have serious consequences; even minor infections can be distressing. Repeated episodes of acute urinary tract infection are distressing to infants, children, young people and their parents or carers.

Although most infants, children and young people recover promptly from a urinary tract infection and have no long-term complications, there is a small subgroup at risk of significant morbidity.

Prompt and accurate diagnosis of urinary tract infection is essential, and it is important to recognise and treat recurrent infection.

This quality standard covers the care of infants, children and young people from birth up to 16 years with first or recurrent upper or lower urinary tract infection and without known underlying uropathy.

The table below shows the outcomes, overarching indicators and improvement areas from the frameworks that the quality standard could contribute to achieving:

NHS Outcomes Framework 2013-14	
Domain 1: Preventing people from dying prematurely	<p>Overarching indicator</p> <p>1a Potential Years of Life Lost (PYLL) from causes considered amenable to healthcare</p> <p>ii Children and young people</p> <p>Improvement area</p> <p><i>Reducing deaths in babies and young children</i></p> <p>1.6 i Infant mortality* (PHOF 4.1)</p>
Domain 4: Ensuring that people have a positive experience of care.	<p>Overarching indicator</p> <p>4a Patient experience of primary care</p> <p>i GP services</p> <p>ii GP Out of Hours services</p> <p>4b Patient experience of hospital care</p> <p>Improvement area</p> <p><i>Improving children and young people's experience of healthcare</i></p> <p>4.8 An indicator is under development</p>
Public health outcomes framework 2013-16	
Domain 4: Healthcare public health and preventing premature mortality	<p>Objective</p> <p>4.1 Reduced numbers of people living with preventable ill health and people dying prematurely, while reducing the gap between communities</p> <p>Indicator</p> <p>4.1 Infant mortality* (NHSOF 1.6)</p>

2 Draft quality standard for urinary tract infection in infants, children and young people under 16

Overview

The draft quality standard for urinary tract infection in infants, children and young people requires that services should be commissioned from and coordinated across all relevant agencies encompassing the whole urinary tract infection in children care pathway. An integrated approach to providing services is fundamental to delivering high quality care to infants, children and young people with a urinary tract infection.

The quality standard should be read in the context of national and local guidelines on training and competencies. All healthcare professionals involved in diagnosing and managing a urinary tract infection in infants, children and young people should be sufficiently and appropriately trained, and competent to deliver the actions and interventions described in the quality standard.

No.	Draft quality statements
1	Infants, children and young people presenting with unexplained fever of 38°C or higher have a urine sample tested within 24 hours.
2	Infants, children and young people with a urinary tract infection have comprehensive risk factors for urinary tract infection and serious underlying pathology recorded as part of their history and examination assessment.
3	Infants, children and young people with a urinary tract infection caused by coliform bacteria have results of microbiology laboratory testing differentiated by <i>Escherichia coli</i> (<i>E.coli</i>) or non- <i>E. coli</i> organisms.
4	Children and young people who have had a urinary tract infection, and their parents or carers as appropriate, are given information about how to recognise re-infection.

In addition, quality standards that should also be considered when commissioning and providing a high-quality service for urinary tract infection in infants, children and young people are listed in section 6.

General questions for consultation:

Question 1	Can you suggest any appropriate healthcare outcomes for each individual quality statement?
Question 2	What important areas of care, if any, are not covered by the quality standard?
Question 3	What, in your opinion, are the most important quality statements and why?
Question 4	Are any of the proposed quality measures inappropriate and, if so, can you identify suitable alternatives?
Please refer to Quality standards in development for additional general points for consideration (available from www.nice.org.uk).	

Draft quality statement 1: Infants, children and young people presenting with unexplained fever of 38°C or higher

Draft quality statement	Infants, children and young people presenting with unexplained fever of 38°C or higher have a urine sample tested within 24 hours.
Rationale	It is important that a urinary tract infection is considered as a cause of feverish illness in children and young people by health care professionals. When a child presents with a temperature of 38°C or above, and there is no obvious source of the infection, a urine sample should be tested within 24 hours to ensure prompt diagnosis.
Draft quality measure	<p>Structure: Evidence of local arrangements to ensure infants, children and young people who present with unexplained fever of 38°C or higher have a urine sample tested within 24 hours.</p> <p>Process:</p> <p>Proportion of infants, children and young people who present with unexplained fever of 38°C or higher who have a urine sample tested within 24 hours.</p> <p>Numerator – the number of people in the denominator who have a urine sample tested within 24 hours.</p> <p>Denominator – the number of infants, children and young people presenting with unexplained fever of 38°C or higher.</p>
Description of what the quality statement means for each audience	<p>Service providers ensure systems are in place for infants, children and young people presenting with unexplained fever of 38°C or higher to have a urine sample tested within 24 hours.</p> <p>Healthcare professionals ensure infants, children and young people presenting with unexplained fever of 38°C or higher have a urine sample tested within 24 hours.</p> <p>Commissioners ensure they commission services for infants, children and young people presenting with unexplained fever of 38°C or higher that carry out testing of urine samples within 24 hours.</p> <p>Infants, children and young people with a temperature of 38°C or higher (a fever) and no obvious infection have a urine sample tested within 24 hours of seeing a healthcare professional.</p>
Source clinical guideline references	NICE clinical guideline 54 recommendations 1.1.1.1 and 1.1.5.1 (key priorities for implementation).
Data source	Structure: Local data collection.

	Process: Local data collection.
Definitions	<p>Although all infants, children and young people with symptoms and signs suggesting urinary tract infection should have a urine sample tested for infection, this statement relates specifically to those presenting with unexplained fever of 38°C or higher.</p> <p>A urinary tract infection may be the cause of fever if there is no obvious source of infection and there is no alternative diagnosis.</p> <p>The urine-testing strategies set shown in tables 2–5 in NICE clinical guideline 54 recommendation 1.1.5.1 are recommended (see development sources).</p> <p>Assess the risk of serious illness in line with Feverish illness in children (NICE clinical guideline 47) to ensure appropriate urine tests and interpretation, both of which depend on the child's age and risk of serious illness.</p>

Draft quality statement 2: History and examination – recording of risk factors

Draft quality statement	Infants, children and young people with urinary tract infection have comprehensive risk factors for urinary tract infection and serious underlying pathology recorded as part of their history and examination assessment.
Rationale	Presenting symptoms combined with findings on examination, urine testing and knowledge of the risk factors are all important in establishing a diagnosis of urinary tract infection. Certain features in history and examination are important for assessing the risk of serious underlying problems in order to identify if a child requires further investigations.
Draft quality measure	<p>Structure: Evidence of local arrangements to ensure infants, children and young people with urinary tract infection have comprehensive risk factors for urinary tract infection and serious underlying pathology recorded as part of their history and examination assessment.</p> <p>Process: Proportion of infants, children and young people with urinary tract infection who have comprehensive risk factors for urinary tract infection and serious underlying pathology recorded as part of their history and examination assessment.</p> <p>Numerator – the number of people in the denominator who have comprehensive risk factors for urinary tract infection and serious underlying pathology recorded as part of their history and examination assessment.</p> <p>Denominator – the number of infants, children and young people with a urinary tract infection.</p>
Description of what the quality statement means for each audience	<p>Service providers ensure systems are in place for infants, children and young people with a urinary tract infection to have comprehensive risk factors for urinary tract infection and serious underlying pathology recorded as part of their history and examination assessment.</p> <p>Healthcare professionals ensure infants, children and young people with a urinary tract infection to have comprehensive risk factors for urinary tract infection and serious underlying pathology recorded as part of their history and examination assessment.</p> <p>Commissioners ensure they commission services for infants, children and young people with a urinary tract infection to have comprehensive risk factors for urinary tract infection and serious underlying pathology recorded as part of their history and examination assessment.</p> <p>Infants, children and young people with a urinary tract infection have any factors that put them at risk of urine infection and serious underlying pathology recorded in their patient notes.</p>

Source clinical guideline references	NICE clinical guideline 54 recommendation 1.1.7.1 (key priority for implementation)
Data source	Structure: Local data collection. Process: Local data collection.
Definitions	<p>NICE clinical guideline 54 recommends that the following risk factors for urinary tract infection and serious underlying pathology should be recorded as part of history and examination on confirmed UTI:</p> <ul style="list-style-type: none"> • poor urine flow • history suggesting previous UTI or confirmed previous UTI • recurrent fever of uncertain origin • antenatally-diagnosed renal abnormality • family history of vesicoureteric reflux (VUR) or renal disease • constipation • dysfunctional voiding • enlarged bladder • abdominal mass • evidence of spinal lesion • poor growth • high blood pressure.

Draft quality statement 3: Laboratory reporting – differentiation of *E. coli* and non-*E. coli* organisms

Draft quality statement	Infants, children and young people with a urinary tract infection caused by coliform bacteria have results of microbiology laboratory testing differentiated by <i>Escherichia coli</i> (<i>E. coli</i>) or non- <i>E. coli</i> organisms.
Rationale	<p>Most urine infections are caused by <i>E. coli</i> bacteria which belong to a group of bacteria called coliforms.</p> <p>When the urine infection is caused by a non-<i>E. coli</i> coliform, or any other type of bacteria, there is an increased risk of serious underlying pathology. It is important that the results of laboratory testing differentiate by <i>E. coli</i> and non-<i>E. coli</i> organisms in order to identify if a child requires further investigations.</p>
Draft quality measure	<p>Structure: Evidence of local arrangements to ensure that microbiology laboratories detecting coliform bacteria as a cause of a urinary tract infection report results differentiated by <i>E. coli</i> or non-<i>E. coli</i> organisms.</p> <p>Process: Proportion of infants, children and young people with a urinary tract infection caused by coliform bacteria who have results of microbiology laboratory testing differentiated by <i>E. coli</i> or non-<i>E. coli</i> organisms.</p> <p>Numerator – the number of people in the denominator who have results of microbiology laboratory testing differentiated by <i>E. coli</i> or non-<i>E. coli</i> organisms.</p> <p>Denominator – the number of infants, children and young people with a urinary tract infection caused by coliform bacteria.</p>
Description of what the quality statement means for each audience	<p>Service providers ensure systems are in place for infants, children and young people with a urinary tract infection caused by coliform bacteria to have results of microbiology laboratory testing differentiated by <i>E. coli</i> or non-<i>E. coli</i> organisms.</p> <p>Healthcare professionals ensure infants, children and young people with a urinary tract infection caused by coliform bacteria have results of microbiology laboratory testing differentiated by <i>E. coli</i> or non-<i>E. coli</i> organisms.</p> <p>Commissioners ensure they commission services for infants, children and young people with a urinary tract infection caused by coliform bacteria that report results of microbiology laboratory testing differentiated by <i>E. coli</i> or non-<i>E. coli</i> organisms.</p> <p>Infants, children and young people with a urinary tract infection caused by coliform bacteria (a type of bacteria that usually lives in the digestive system) have results of laboratory tests showing whether the bacteria were <i>E. coli</i> or non-<i>E. coli</i>.</p>
Source clinical	Derived from definitions of atypical urinary tract infection as

guideline references	outlined in NICE clinical guideline 54 .
Data source	Structure: Local data collection. Process: Local data collection.
Definitions	NICE clinical guideline 54 specifies atypical causes of urinary tract infection, and, includes non- <i>E. coli</i> organisms as an atypical cause in infants, children and young people.

Draft quality statement 4: Information about recognising re-infection

Draft quality statement	Children and young people who have had a urinary tract infection, and their parents or carers as appropriate, are given information about how to recognise re-infection.
Rationale	Some children and young people will experience a recurrence of urinary tract infection and it is important that these are recognised and treated quickly to reduce the risk of complications. Parents, carers and children and young people where appropriate should be aware of the importance of seeking medical advice straightaway if they think their child or young person has another urinary tract infection.
Draft quality measure	<p>Structure: Evidence of local arrangements to ensure children and young people who have had a urinary tract infection, are given information about how to recognise re-infection.</p> <p>Process: Proportion of children and young people, and/or their parents or carers, and parents or carers of infants who receive information about how to recognise re-infection.</p> <p>Numerator – the number of people in the denominator who receive information about how to recognise re-infection.</p> <p>Denominator– the number of infants, children and young people who have had a urinary tract infection or their parent or carer.</p> <p>Outcome: Patient and/or parent or carer satisfaction with information received about how to recognise re-infection.</p>
Description of what the quality statement means for each audience	<p>Service providers ensure systems are in place for children and young people who have had a urinary tract infection, and/or their parents or carers, and parents or carers of infants to be given information about how to recognise re-infection.</p> <p>Healthcare professionals give information about how to recognise re-infection to children and young people who have had a urinary tract infection, and/or their parents or carers, and parents or carers of infants.</p> <p>Commissioners ensure they commission services for infants, children and young people who have had a urinary tract infection that give information about how to recognise re-infection to the children and young people, and/or their parents or carers, and to the parents or carers of infants.</p> <p>Children and young people who have had a urinary tract infection, and/or their parents or carers, and parents or carers of infants are given information about how to recognise re-infection.</p>
Source clinical guideline references	NICE clinical guideline 54 recommendation 1.6.1.2.

Data source	<p>Structure: Local data collection.</p> <p>Process: Local data collection.</p> <p>Outcome: Local data collection.</p>
Definitions	<p>The general practitioner or hospital paediatrician should give children and young people who have had a urinary tract infection, and/or their parents or carers, and the parents or carers of infants, information and advice about possible re-infection and the importance of seeking medical advice straightaway if there are signs of another urinary tract infection.</p>
Equality & diversity considerations	<p>The quality standard will clearly state that good communication between health care professionals and children and young people with suspected or confirmed urinary tract infection, and their parents or carers, is essential.</p> <p>Treatment and care, and the information given about it, should be culturally appropriate. It should also be accessible to people with additional needs such as physical, sensory or learning disabilities, and to people who do not speak or read English.</p> <p>Children and young people with suspected or confirmed UTI, or their parents or carers, should have access to an interpreter or advocate if needed.</p>

3 Status of this quality standard

This is the draft quality standard released for consultation from 25 January until 22 February 2013. This document is not NICE's final quality standard on urinary tract infection in children. The statements and measures presented in this document are provisional and may change after consultation with stakeholders.

Comments on the content of the draft standard must be submitted by 5pm on 22 February 2013. All eligible comments received during consultation will be reviewed by the Quality Standards Advisory Committee and the quality statements and measures will be refined in line with the Quality Standards Advisory Committee considerations. The final quality standard will then be available on the [NICE website](#) in July.

4 Using the quality standard

It is important that the quality standard is considered alongside current policy and guidance documents listed in the evidence sources section.

The quality measures accompanying the quality statements aim to improve the structure, process and outcomes of healthcare. They are not a new set of targets or mandatory indicators for performance management.

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

We have indicated where national indicators currently exist and measure the quality statement. National indicators include those developed by the Health and Social Care Information Centre through their [Indicators for Quality Improvement](#). For statements for which national quality indicators do not exist,

the quality measures should form the basis for audit criteria developed and used locally to improve the quality of healthcare.

For further information, including guidance on using quality measures, please see [What makes up a NICE quality standard](#).

5 Diversity, equality and language

During the development of this quality standard, equality issues have been considered and equality assessments will be published on the NICE website with the final version of the quality standard.

Good communication between healthcare professionals and children and young people with a urinary tract infection is essential. Treatment and care, and the information given about it, should be culturally appropriate. It should also be accessible to people with additional needs such as physical, sensory or learning disabilities, and to people who do not speak or read English. Children and young people (and/or their parents or carers) with a urinary tract infection should have access to an interpreter or advocate if needed.

6 How this quality standard was developed

The evidence sources used to develop this quality standard are listed in appendix 1, along with relevant policy context. Further explanation of the methodology used can be found in the [Quality standards process guide](#).

7 Related NICE quality standards

- [Patient experience in adult NHS services](#). NICE quality standard (2012).
- Nocturnal enuresis. NICE quality standard. Publication date to be confirmed.
- Feverish illness in childhood. NICE quality standard. Publication date to be confirmed.

Appendix 1: Development sources

Evidence sources

The documents below contain clinical guideline recommendations or other recommendations that were used by the QSAC to develop the quality standard statements and measures.

[Urinary tract infection in children](#). NICE clinical guideline 54 (2007).

Policy context

It is important that the quality standard is considered alongside current policy documents, including:

Department of Health (2007). [Continence exemplar](#)

Department of Health (2004). [National service framework for children, young people and maternity services](#)

Supplementary information: testing strategies

NICE clinical guideline 54, recommendation 1.1.5.1 Urine testing

NICE recommendation 1.1.5.1 The urine-testing strategies shown in tables 2–5 are recommended¹.

As with all diagnostic tests there will be a small number of false negative results; therefore clinicians should use clinical criteria for their decisions in cases where urine testing does not support the findings.

Table 2 Urine-testing strategy for infants younger than 3 months

All infants younger than 3 months with suspected UTI (see table 1) should be referred to paediatric specialist care and a urine sample should be sent for urgent microscopy and culture. These infants should be managed in accordance with the recommendations for this age group in [Feverish illness in children](#) (NICE clinical guideline 47).

¹ Assess the risk of serious illness in line with [Feverish illness in children](#) (NICE clinical guideline 47) to ensure appropriate urine tests and interpretation, both of which depend on the child's age and risk of serious illness.

Table 3 Urine-testing strategies for infants and children 3 months or older but younger than 3 years

Urgent microscopy and culture is the preferred method for diagnosing UTI in this age group; this should be used where possible.	
If the infant or child has specific urinary symptoms	Urgent microscopy and culture should be arranged and antibiotic treatment should be started. When urgent microscopy is not available, a urine sample should be sent for microscopy and culture, and antibiotic treatment should be started.
If the symptoms are non-specific to UTI	For an infant or child with a high risk of serious illness: the infant or child should be urgently referred to a paediatric specialist where a urine sample should be sent for urgent microscopy and culture. Such infants and children should be managed in line with Feverish illness in children (NICE clinical guideline 47). For an infant or child with an intermediate risk of serious illness: if the situation demands, the infant or child may be referred urgently to a paediatric specialist. For infants and children who do not require paediatric specialist referral, urgent microscopy and culture should be arranged. Antibiotic treatment should be started if microscopy is positive (see table 5). When urgent microscopy is not available, dipstick testing may act as a substitute. The presence of nitrites suggests the possibility of infection and antibiotic treatment should be started (see table 4). In all cases, a urine sample should be sent for microscopy and culture. For an infant or child with a low risk of serious illness: microscopy and culture should be arranged. Antibiotic treatment should only be started if microscopy or culture is positive.

Table 4 Urine-testing strategies for children 3 years or older

Dipstick testing for leukocyte esterase and nitrite is diagnostically as useful as microscopy and culture, and can safely be used.	
If both leukocyte esterase and nitrite are positive	The child should be regarded as having UTI and antibiotic treatment should be started. If a child has a high or intermediate risk of serious illness and/or a past history of previous UTI, a urine sample should be sent for culture.
If leukocyte esterase is negative and nitrite is positive	Antibiotic treatment should be started if the urine test was carried out on a fresh sample of urine. A urine sample should be sent for culture. Subsequent management will depend upon the result of urine culture.
If leukocyte esterase is positive and nitrite is negative	A urine sample should be sent for microscopy and culture. Antibiotic treatment for UTI should not be started unless there is good clinical evidence of UTI (for example, obvious urinary symptoms). Leukocyte esterase may be indicative of an infection outside the urinary tract which may need to be managed differently.
If both leukocyte esterase and nitrite are negative	The child should not be regarded as having UTI. Antibiotic treatment for UTI should not be started, and a urine sample should not be sent for culture. Other causes of illness should be explored.