

Urinary tract infection: diagnosis, treatment and long term management of urinary tract infection in children

NICE guideline

Draft for consultation, October 2006

If you wish to comment on this version of the guideline, please be aware that all the supporting information and evidence is contained in the full version.

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Introduction

In the past 30–50 years, the natural history of urinary tract infection (UTI) in children has changed, as a result of the introduction of antibiotics and improvements in healthcare. This change has contributed to uncertainty about the most appropriate and effective way to diagnose and treat UTI in children and whether or not investigations and follow up are justified.

UTI is a common bacterial infection causing illness in infants and children. It may be difficult to recognise UTI in children because the presenting symptoms and/or signs are non-specific, particularly in the youngest children. Urine collection and interpretation of urine tests in infants and toddlers are not easy and therefore it may not always be possible to unequivocally confirm the diagnosis.

Current management involving imaging, prophylaxis and prolonged follow up has placed a heavy burden on NHS primary and secondary care resources, and is unpleasant for children and families, costly and not evidence-based. The aim of this guideline is to lead to more consistent clinical practice, by considering the effectiveness of investigations and treatment including surgical intervention. The importance of accurate diagnosis depends on the effectiveness of subsequent investigations and follow up in altering the outcome.

Patient-centred care

This guideline offers best practice advice on the care of children and young people with urinary tract infection (UTI).

Treatment and care should take into account patients' needs and preferences. Children and young people with UTI should have the opportunity to make informed decisions about their care and treatment, in partnership with their healthcare professionals. If patients do not have the capacity to make decisions, healthcare professionals should follow the Department of Health guidelines – 'Reference guide to consent for examination or treatment' (2001) (available from www.dh.gov.uk). From April 2007 healthcare professionals will need to follow a code of practice accompanying the Mental Capacity Act (summary available from www.dca.gov.uk/menincap/bill-summary.htm).

Good communication between healthcare professionals and patients is essential. It should be supported by evidence-based written information tailored to the patient's needs. Treatment and care, and the information patients are 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.

Parents, carers and relatives should have the opportunity to be involved in decisions about the patient's care and treatment, unless the patient specifically excludes them.

Parents, carers and relatives should also be given the information and support they need.

Key priorities for implementation

Symptoms and signs

- Neonates with any signs or symptoms (see table below) should have a urine sample tested. **[1.1.2.1]**
- Children who are unable to communicate their symptoms and have two or more clinical signs or symptoms (see table below) should have a urine sample tested. UTI should also be considered in children with unexplained persistent symptoms or signs. **[1.1.2.2]**
- Children who are able to communicate their symptoms and present with any of most common symptoms or signs or two or more less common symptoms or signs should have a urine sample tested. **[1.1.2.3]**

Presenting signs and symptoms in children with UTI [table 1]

Age groups		Most common —————> Least common		
Neonates		Fever Vomiting Lethargy Irritability	Poor feeding Failure to thrive	Abdominal pain Jaundice Haematuria Offensive urine
Children	Pre-verbal	Fever	Abdominal pain or abdominal/loin tenderness Vomiting Poor feeding	Lethargy Irritability Haematuria Offensive urine Failure to thrive
	Verbal	Frequency Dysuria	Dysfunctional voiding Changes to continence Abdominal/loin pain or tenderness	Fever Malaise Vomiting Haematuria Offensive urine Cloudy urine
Any child can present with septic shock secondary to UTI, although this is more common in infants. Fever defined as > 38°C				

Urine collection

- Clean catch urine sample is the recommended method for urine collection.

If a clean catch urine sample is unobtainable:

- Other non-invasive methods, such as urine collection pads should be used. It is important to follow the manufacturer's instructions in using urine collection pads.
- When it is not possible or practical to collect urine by non-invasive methods, catheter samples or suprapubic aspiration (SPA) should be used.
- If SPA is required, ultrasound guidance should be used to demonstrate the presence of urine in the bladder before SPA is attempted. This procedure should only be done by appropriately trained clinicians.

[1.1.4.1]

- Cotton wool balls, gauze and sanitary towels should not be used to collect urine in children.
- In an acutely unwell child it is highly preferable that a urine sample is obtained; however, treatment should not be delayed if a urine sample is unobtainable. **[1.1.4.2]**

Antibiotic treatment

- Systemically well children with UTI:
 - Treat with 3 days oral antibiotics. The choice of antibiotics should be directed by locally developed multidisciplinary guidance.
 - If the child is still unwell after 24–48 hours carers should be advised to return for review.
 - Systemically well children who return for review and who have not improved should be reassessed. If an alternative diagnosis is not made, a urine sample should be sent for culture to identify the presence of bacteria and determine antibiotic sensitivity. Severely ill children should be referred to secondary care. **[1.2.1.1]**

Antibiotic prophylaxis

- Antibiotic prophylaxis should not be routinely recommended in children with UTI. [1.2.4.1]

Imaging

- Children who are systemically well only need ultrasound (within 6 weeks) if they are younger than 6 months of age or have had recurrent infection. No other investigations are required for any child who is systemically well unless they have recurrent UTI and abnormality on ultrasound, in which case late dimercapto succinic acid (DMSA) should be considered. [1.3.5.1]
- Children who are systemically unwell should be imaged according to the following tables. [1.3.5.2]

Infants aged 0 to 6 months

Test	Responds well to treatment	Severe or atypical UTI	Recurrent UTI
Early ultrasound	N	Y	Y
Late ultrasound	Y (within 6 weeks)*	N	N
Early DMSA	N	N	N
Late DMSA	N	Y**	Y
MCUG	N	Y***	Y***

*If abnormal consider micturating cystourethrography (MCUG)

**Late DMSA in children with severe or atypical illness and those who responded poorly to treatment is to assess the level of renal damage.

*** When MCUG is performed, prophylactic antibiotics should be given orally for 3 days with MCUG taking place on the second day

Children 6 months to toilet trained

Test	Responds well to treatment	Severe or atypical UTI	Recurrent UTI
Early Ultrasound	N	Y	N
Late ultrasound	N	N	Y
Early DMSA	N	N	N
Late DMSA	N	Y	Y
MCUG	N	N*	N*

* While MCUG need not be performed routinely it should be considered if the following features are present:

- Poor urine flow
- Family history of vesicoureteric reflux (VUR).
- Non *E.coli* infection
- Dilatation on ultrasound

Children toilet trained and older

Test	Responds well to treatment	Severe or atypical UTI	Recurrent UTI
Early Ultrasound	N	Y*	N
Late ultrasound	N	N	Y
Early DMSA	N	N	N
Late DMSA	N	N	Y
MCUG	N	N	N

*Ultrasound in toilet-trained children should be performed with a full bladder with an estimate of bladder volume pre and post micturition.

Definitions

Atypical UTI: Still febrile after 48 hours of appropriate treatment, poor urine flow or non-*E.coli*

Recurrent UTI: Two or more episodes of UTI with systemic symptoms/signs or three or more episodes of UTI without systemic symptoms/signs.

Early ultrasound: During the acute episode.

Late ultrasound: Within 6 weeks

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Early DMSA: During the acute illness

Late DMSA: Six month or more following the acute infection

MCUG: Prophylactic antibiotics should be given for 3 days with MCUG taking place on the second day.

1 Guidance

The following guidance is based on the best available evidence. The full guideline ([\[add hyperlink\]](#)) gives details of the methods and the evidence used to develop the guidance (see section 5 for details).

1.1 *Diagnosis*

1.1.1 Predisposing factors

1.1.1.1 Women should be made aware that breast-feeding, among other benefits, is likely to offer protection against urinary tract infection (UTI) in infants.

1.1.2 Symptoms and signs

1.1.2.1 Neonates with any signs or symptoms (table 1) should have a urine sample tested.

1.1.2.2 Children who are unable to communicate their symptoms and have two or more clinical signs or symptoms (table 1) should have a urine sample tested. UTI should also be considered in children with unexplained persistent symptoms or signs.

1.1.2.3 Children who are able to communicate their symptoms and present with any of most common symptoms or signs or two or more less common symptoms or signs should have a urine sample tested.

Table 1 Presenting signs and symptoms in children with UTI

Age groups		Most common ▶ Least common		
Neonates		Fever Vomiting Lethargy Irritability	Poor feeding Failure to thrive	Abdominal pain Jaundice Haematuria Offensive urine
Children	Pre-verbal	Fever	Abdominal pain or abdominal/loin tenderness Vomiting Poor feeding	Lethargy Irritability Haematuria Offensive urine Failure to thrive
	Verbal	Frequency Dysuria	Dysfunctional voiding Changes to continence Abdominal/loin pain or tenderness	Fever Malaise Vomiting Haematuria Offensive urine Cloudy urine
Any child can present with septic shock secondary to UTI, although this is more common in infants. Fever defined as > 38°C.				

1.1.3 Clinical features of UTI

1.1.3.1 Children with suspected UTI and the following the signs and symptoms should be defined as 'severely ill':

- signs of dehydration
- reduced activity/responsiveness
- pale / mottled / ashen skin or blue
- ill appearance.

1.1.3.2 Children with suspected UTI, fever > 38°C and at least one of the following features should be considered to be 'systemically unwell':

- loin or abdominal pain or tenderness
- vomiting
- irritability
- poor feeding
- chills and rigors.

- 1.1.3.3 All other children with suspected UTI but no systemic features should be considered to be 'systemically well'.

1.1.4 Urine collection

- 1.1.4.1 Clean catch urine sample is the recommended method for urine collection. If a clean catch urine sample is unobtainable:

- Other non-invasive methods, such as urine collection pads should be used. It is important to follow the manufacturer's instructions in using urine collection pads.
- When it is not possible or practical to collect urine by non-invasive methods, catheter samples or suprapubic aspiration (SPA) should be used.
- If SPA is required, ultrasound guidance should be used to demonstrate the presence of urine in the bladder before SPA is attempted. This procedure should only be done by appropriately trained clinicians.

- 1.1.4.2 In an acutely unwell child it is highly preferable that a urine sample is obtained; however, treatment should not be delayed if a urine sample is unobtainable.

- 1.1.4.3 Cotton wool balls, gauze and sanitary towels should not be used to collect urine in children.

1.1.5 Urine preservation

- 1.1.5.1 If urine cannot be cultured within 4 hours of collection the sample should be refrigerated or preserved with boric acid immediately on voiding.

- 1.1.5.2 When boric acid is used, the manufacturer's instructions should be followed to ensure correct specimen volume to avoid potential toxicity against bacteria in the specimen.

1.1.6 Urine testing

1.1.6.1 In children older than 3 years, combined nitrite and leukocyte esterase (LE) dipstick tests are recommended to diagnose UTI.

1.1.6.2 In children under the age of 3 years urine should be sent for microscopy and culture to diagnose UTI.

Table 2 Dipstick results and UTI diagnosis

	Urine dipstick	Diagnosis
1.1.6.3	Nitrite and LE positive	UTI – treat with antibiotics
1.1.6.4	Nitrite positive and LE negative	Probable UTI – treat with antibiotics
1.1.6.5	Nitrite negative and LE positive	May or may not be UTI – management should be based on clinical judgement
1.1.6.6	Nitrite and LE negative	UTI excluded – no antibiotic treatment

1.1.6.7 Dipstick testing is no less accurate than microscopy in children over the age of 3 years but is less operator dependent and less costly, therefore microscopy is not routinely recommended for diagnosing UTI in older children.

1.1.6.8 Urine samples should not be routinely sent for culture in children over the age of 3 years with first time UTI who have a urine dipstick that is negative or positive for both nitrite and leukocyte esterase.

1.1.6.9 Urine samples should be sent for culture in:

- systemically unwell children of all ages
- all children under the age of 3 years
- single positive result for nitrite or leukocyte esterase
- recurrent UTI

- children who do not respond to treatment within 24–48 hours
- when clinical symptoms and dipstick tests do not correlate.

1.1.7 Laboratory investigations

1.1.7.1 C-reactive protein (CRP) alone should not be used to differentiate upper from lower UTI in children.

1.2 Management

1.2.1 Antibiotic treatment

1.2.1.1 Systemically well children with UTI.

- Treat with 3 days oral antibiotics. The choice of antibiotics should be directed by locally developed multidisciplinary guidance.
- If the child is still unwell after 24–48 hours carers should be advised to return for review.
- Systemically well children who return for review and who have not improved should be reassessed. If an alternative diagnosis is not made, a urine sample should be sent for culture to identify the presence of bacteria and determine antibiotic sensitivity. Severely ill children should be referred to secondary care.

1.2.1.2 Systemically unwell children with UTI.

- Consider referral to secondary care setting.
- Treat with 10–14 days oral antibiotic treatment.

1.2.1.3 If oral antibiotics are not tolerated and if the child is severely unwell, 2–4 days IV antibiotic treatment followed by oral antibiotics for 8 to 10 days is recommended.

1.2.1.4 In infants and children who receive aminoglycosides (gentamicin or amikacin), once daily dosing is recommended.

1.2.1.5 In the rare circumstances where oral or IV treatment are not possible, treatment should be considered.

1.2.1.6 Children who are systemically unwell and who do not respond to oral, IV or IM antibiotics within 24–48 hours should have a repeat urine culture to identify the causative organism and the antibiotic sensitivity if an alternative diagnosis is not made.

1.2.2 Antibiotics for asymptomatic bacteriuria

1.2.2.1 Asymptomatic bacteriuria in children should not be treated with antibiotics.

1.2.3 Non-antibiotic strategies for preventing recurrence

1.2.3.1 Dysfunctional elimination syndromes and constipation should be addressed in children who have had a UTI.

1.2.3.2 Children who have had a UTI should be encouraged to drink an adequate amount.

1.2.3.3 Parents and carers should be advised to prevent children from delaying voiding by ensuring ready access to clean toilets when required at all times.

1.2.4 Antibiotic prophylaxis

1.2.4.1 Antibiotic prophylaxis should not be routinely recommended in children with UTI.

1.3 *Imaging*

1.3.1 Evaluation of the structure of the urinary tract

1.3.1.1 In all children with severe or atypical illness who do not respond to treatment within 48 hours, early ultrasound scan is recommended to identify structural abnormalities of the urinary tract. (See recommendation 1.3.5.2.)

1.3.1.2 In infants aged 0 to 6 months, late ultrasound (within 6 weeks) should be carried out following the first simple UTI. (See recommendation 1.3.5.2.)

1.3.1.3 In children over 6 months of age with simple first time UTI that responds to treatment, routine ultrasound is not recommended. (See recommendation 1.3.5.2.)

1.3.2 Detecting vesicoureteric reflux

1.3.2.1 Routine imaging to identify vesicoureteric reflux is not recommended in children who have had a UTI, except in specific circumstances outlined in the tables. (See recommendation 1.3.5.2.)

1.3.2.2 When imaging is required to detect reflux in pre toilet trained boys, a micturating cystourethrogram (MCUG) is recommended so that the urethra is also imaged. In girls cystosonography is a valid alternative.

1.3.3 Detecting renal parenchymal defects

1.3.3.1 A dimercapto succinic acid (DMSA) scan 6 months following the acute infection should be used to detect renal parenchymal defects as recommended. (See recommendation 1.3.5.2.)

1.3.3.2 If the child has a subsequent UTI while awaiting DMSA the timing of the DMSA should be reviewed.

1.3.3.3 Intravenous urography (IVU) should not be used routinely to detect renal parenchymal defects in children who have had a UTI.

1.3.4 Localisation of infection

1.3.4.1 The routine use of imaging in the localisation of a UTI is not recommended.

1.3.4.2 In the rare instances where it is clinically important to confirm or exclude upper tract infection a DMSA scan is recommended.

1.3.4.3 If ultrasound is being performed during the acute infection to identify structural abnormalities the power doppler function should be used because it may provide additional information about renal parenchymal involvement.

1.3.5 Recommendations for routine imaging

1.3.5.1 Children who are systemically well need ultrasound (within 6 weeks) only if they are younger than 6 months of age or have had recurrent infection. No other investigations are required for any child who is systemically well unless they have recurrent UTI and abnormality on ultrasound in which case late DMSA should be considered.

1.3.5.2 Children who are systemically unwell should be imaged according to the following tables.

Table 3 Infants aged 0 to 6 months

Test	Responds well to treatment	Severe or atypical UTI	Recurrent UTI
Early ultrasound	N	Y	Y
Late ultrasound	Y (within 6 weeks)*	N	N
Early DMSA	N	N	N
Late DMSA	N	Y**	Y
MCUG	N	Y***	Y***

*If abnormal consider MCUG
 **Late DMSA in children with severe or atypical illness and those who responded poorly to treatment is to assess the level of renal damage.
 *** When MCUG is performed, prophylactic antibiotics should be given orally for 3 days with MCUG taking place on the second day.

Table 4 Children 6 months to toilet trained

Test	Responds well to treatment	Severe or atypical UTI	Recurrent UTI
Early ultrasound	N	Y	N
Late ultrasound	N	N	Y
Early DMSA	N	N	N
Late DMSA	N	Y	Y
MCUG	N	N*	N*

* While MCUG need not be performed routinely it should be considered if the following features are present:

- poor urine flow
- family history of VUR
- non *E. coli* infection
- dilatation on ultrasound.

Table 5 Children toilet trained and older

Test	Responds well to treatment	Severe or atypical UTI	Recurrent UTI
Early ultrasound	N	Y*	N
Late ultrasound	N	N	Y
Early DMSA	N	N	N
Late DMSA	N	N	Y
MCUG	N	N	N

*Ultrasound in toilet-trained children should be performed with a full bladder with an estimate of bladder volume pre and post micturition.

*Ultrasound in toilet-trained children should be performed with a full bladder with an estimate of bladder volume pre and post micturition.

Definitions

Atypical UTI: Still febrile after 48 hours of appropriate treatment, poor urine flow or non-*E.coli*

Recurrent UTI: Two or more episodes of UTI with systemic symptoms/signs or three or more episodes of UTI without systemic symptoms/signs.

Early ultrasound: During the acute episode.

Late ultrasound: Within 6 weeks

Early DMSA: During the acute illness

Late DMSA: Six month or more following the acute infection

MCUG: Prophylactic antibiotics should be given for 3 days with MCUG taking place on the second day.

1.4 *Surgical intervention*

1.4.1.1 Surgical management of reflux with or without UTI is not routinely recommended.

1.5 *Follow up*

1.5.1.1 Children who do not undergo imaging investigations should not routinely be followed up.

1.5.1.2 Parents/carers should be informed of the results of the investigations in writing.

1.5.1.3 When results are normal, an outpatient appointment is not necessarily required.

1.5.1.4 Children who have recurrent UTIs or abnormal imaging investigations should be seen by a paediatric specialist. Follow up should include height, weight, blood pressure and routine testing for proteinuria.

1.5.1.5 Children who have bilateral renal abnormalities, impaired kidney function, raised blood pressure and/or proteinuria should receive monitoring and appropriate management by a specialist to slow the progression of chronic kidney disease.

1.5.1.6 Children who are asymptomatic following an episode of UTI should not routinely have their urine re-tested for infection.

1.5.1.7 Asymptomatic bacteriuria is not an indication for follow up.

1.6 *Advice*

1.6.1.1 Healthcare professionals should ensure that when a child or young person has been identified as having a possible UTI they are given appropriate information about the need for treatment, the

importance of following any course of treatment through and advice around prevention

1.6.1.2 Healthcare professionals should ensure that children and young people, parents and carers, are aware of the possibility of a UTI reoccurring and that they should seek prompt treatment for any suspected re-infection.

1.6.1.3 Healthcare professionals should give advice/information on:

- prompt recognition of symptoms and urine collection and testing
- appropriate treatment options
- prevention
- the nature of and reason for any urinary tract investigation
- prognosis.

2 Notes on the scope of the guidance

NICE guidelines are developed in accordance with a scope that defines what the guideline will and will not cover. The scope of this guideline is available from www.nice.org.uk/page.aspx?o=256448.

The guideline has been developed with the aim of providing guidance on several aspects of urinary tract infection including: when to consider the diagnosis of UTI in sick and/or symptomatic infants and children who were previously healthy; when and how to collect urine for the diagnosis of UTI in infants and children; which tests establish or exclude UTI as the cause of illness in infants and children; how to treat sick and/or symptomatic infants and children and symptomatic re-infection; when to use prophylactic antibiotics, which antibiotics to use and when to stop them; when to use investigations to assess the structure and function of the urinary tract; when to refer to secondary and tertiary care; when to offer surgical intervention; when to do long-term follow up; and what advice to give carers and parents, including what to do if another UTI occurs.

Areas not addressed by the guideline include children with urinary catheters in situ, neurogenic bladders, already known to have significant pre-existing uropathies, underlying renal disease (for example, nephrotic syndrome), immunosuppressed children, infants and children in intensive care units, preventative measures or long-term management of sexually active girls with recurrent UTI.

How this guideline was developed

NICE commissioned the National Collaborating Centre for Women's and Children's Health to develop this guideline. The Centre established a Guideline Development Group (see appendix A), which reviewed the evidence and developed the recommendations. An independent Guideline Review Panel oversaw the development of the guideline (see appendix B).

There is more information in the booklet: 'The guideline development process: an overview for stakeholders, the public and the NHS' (second edition, published April 2006), which is available from www.nice.org.uk/guidelinesprocess or by telephoning 0870 1555 455 (quote reference N****).

3 Implementation

The Healthcare Commission assesses the performance of NHS organisations in meeting core and developmental standards set by the Department of Health in 'Standards for better health', issued in July 2004. Implementation of clinical guidelines forms part of the developmental standard D2. Core standard C5 says that national agreed guidance should be taken into account when NHS organisations are planning and delivering care.

NICE has developed tools to help organisations implement this guidance (listed below). These are available on our website (www.nice.org.uk/CGXXX).

[NICE to amend list as needed at time of publication]

- Slides highlighting key messages for local discussion.
- Costing tools

- Costing report to estimate the national savings and costs associated with implementation.
- Costing template to estimate the local costs and savings involved.
- Implementation advice on how to put the guidance into practice and national initiatives that support this locally.
- Audit criteria to monitor local practice.

4 Research recommendations

The Guideline Development Group has made the following recommendations for research, based on its review of evidence, to improve NICE guidance and patient care in the future. The Guideline Development Group's full set of research recommendations is detailed in the full guideline (see section 5).

4.1 *Diagnosis*

What is the accuracy and effectiveness of nitrite and leukocyte esterase urine dipstick tests alone and in combination in children of different age groups?

Why this is important

Traditionally the diagnosis of UTI has been dependent on microscopy and culture over 24–48 hours. Microscopy can be carried out immediately but results are not always reported until culture is available. Microscopy at the bed side is effective but requires skills that are not widely available. This means that infants and children with distressing symptoms have often been left untreated for 2–3 days while awaiting treatment. Dipsticks for nitrite and LE have been shown to be as effective as microscopy and much easier to use. There is a risk of missing a high proportion of cases of acute UTI in young children when using dipstick because of lack of urinary nitrite due to frequent bladder emptying in infants and children below 3 years.

4.2 *Antibiotic prophylaxis*

What is the effectiveness of antibiotic prophylaxis for preventing subsequent UTIs and renal parenchymal defects in children?

Why this is important

A high proportion of girls and a minority of boys with UTI develop further infections some of which are acutely distressing, systemic illness or subsequent renal damage. Renal damage is most likely in children with high grade VUR and this is the reason for some of the imaging tests previously recommended. Prophylactic antibiotics have been used on the assumption that they prevent these problems. However chronic antibiotic use has a number of disadvantages for the individual as well as the population as a whole. Formal evaluation of the ability of prophylactic antibiotics for the prevention of distressing symptoms due to recurrent UTI and for the prevention of scarring would affect not only the use of antibiotics but also the imaging investigations recommended.

4.3 *Surgical intervention*

What is the effectiveness of surgical intervention or prophylaxis for vesicoureteric reflux in preventing recurrent UTIs and renal parenchymal damage?

Why this is important

Management strategies for children with recurrent UTI have been based on the assumption that prevention of VUR or UTI by surgery or prophylaxis is more effective in preventing renal damage than treating symptomatic infections promptly whenever they occur. In addition there have been recent developments in minimally invasive surgery which have been shown to be relatively safe and effective in reducing or eliminating VUR. Studies comparing these interventions with adequate controls are required to establish the benefit of modern surgery in preventing recurrent symptomatic infection and renal damage.

4.4 *Long term risk*

What are the long term risks including renal scarring and renal function in children who have a UTI during childhood?

Why this is important

UTI and VUR in young children have been shown to be associated with both congenital and acquired renal damage. Progressive scarring is well documented in children with high grade VUR and recurrent UTI. Scarring has been associated with severe hypertension, proteinuria, complications in pregnancy and progression to ERF. These risks are likely to be greater in children with bilateral renal parenchymal defects. However, the frequency and magnitude of these risks for children with unilateral and bilateral renal damage are unclear. Knowledge of the risk of serious or progressive complications would be useful to inform management of children with first time and recurrent UTIs.

5 Other versions of this guideline

5.1 Full guideline

The full guideline, 'Urinary tract infection: diagnosis, treatment and long-term management of urinary tract infection in children', contains details of the methods and evidence used to develop the guideline. It is published by the National Collaborating Centre for Women's and Children's Health, and is available from [NCC website details to be added], our website (www.nice.org.uk/CGXXXfullguideline) and the National Library for Health (www.nlh.nhs.uk). **[Note: these details will apply to the published full guideline.]**

5.2 Quick reference guide

A quick reference guide for healthcare professionals is also available from www.nice.org/CGXXXquickrefguide

For printed copies, phone the NHS Response Line on 0870 1555 455 (quote reference number N1XXX). **[Note: these details will apply when the guideline is published.]**

5.3 ***'Understanding NICE guidance'***

Information for patients and carers ('Understanding NICE guidance') is available from www.nice.org.uk/CGXXXpublicinfo

For printed copies, phone the NHS Response Line on 0870 1555 455 (quote reference number N1XXX). **[Note: these details will apply when the guideline is published.]**

6 **Related NICE guidance**

NICE is developing the following guidance (details available from www.nice.org.uk).

- Feverish illness in children. NICE clinical guideline. (Publication expected May 2007.)

7 **Updating the guideline**

NICE clinical guidelines are updated as needed so that recommendations take into account important new information. We check for new evidence 2 and 4 years after publication, to decide whether all or part of the guideline should be updated. If important new evidence is published at other times, we may decide to do a more rapid update of some recommendations.

Appendix A: The Guideline Development Group

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Appendix B: The Guideline Review Panel

The Guideline Review Panel is an independent panel that oversees the development of the guideline and takes responsibility for monitoring adherence to NICE guideline development processes. In particular, the panel ensures that stakeholder comments have been adequately considered and responded to. The Panel includes members from the following perspectives: primary care, secondary care, lay, public health and industry.

[NICE to add]

[Name; style = Unnumbered bold heading]

[job title and location; style = NICE normal]

Appendix C: The algorithms

[NB NICE to add a note here if the algorithms are being published as a separate file on the website]