Feverish illness: assessment and initial management in children younger than 5 years of age

NICE guideline

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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.

Contents

Introduction

Feverish illness in young children usually indicates an underlying infection and, as such, the condition is a cause of concern for parents and carers. Feverish illness is very common in young children with between 20 and 40% of parents reporting such an illness each year. As a result, fever is probably the commonest reason for a child to be taken to the doctor. Feverish illness is also the second commonest reason for a child being admitted to hospital. Despite advances in healthcare, infections remain the commonest cause of death in children under the age of five years.

Fever in young children can be a diagnostic challenge for healthcare professionals because it is often difficult to identify the cause. In most cases, the illness is due to a self-limiting viral infection. However, fever may also be the presenting feature of serious bacterial illnesses such as meningitis or pneumonia. There are a significant number of children who have no obvious cause of fever despite careful assessment. These children with fever without apparent source are a particular concern to healthcare professionals because it is especially difficult to distinguish between simple viral illnesses and life-threatening bacterial infections in this group.

At present, although there are guidelines for many individual infections, there is no national guidance on the management of fever as a presenting illness. There is considerable variation in management across the UK and there is some evidence that mortality and morbidity from infectious diseases in children is sometimes associated with deficiencies in healthcare. There is also some evidence that death rates are higher in the least affluent areas.

As a result of the above factors, there is a perceived need to improve the recognition, evaluation and immediate treatment of feverish illnesses in children. This guideline is designed to aid the initial assessment and immediate treatment of feverish illness in young children presenting to primary or secondary care.

Patient-centred care

This guideline offers best practice advice on the care of children with feverish illness.

Treatment and care should take into account patients' needs and preferences. People with children who have fever 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.

Carers and relatives should have the opportunity to be involved in decisions about the patient's care and treatment.

Carers and relatives should also be given the information and support they need.

Key priorities for implementation

Detection of fever

- In children aged four weeks to five years, healthcare professionals should measure body temperature by one of the following methods:
    - Electronic thermometer in the axilla
    - Chemical dot thermometer in the axilla
    - Infra-red tympanic thermometer **1.1.2.1**
- Reported parental perception of a fever should be considered valid and taken seriously by healthcare professionals. **1.1.3.1**

Traffic light system

- In addition to seeking a focus of infection in children with fever, healthcare professionals should look for the following symptoms and signs: **1.2.3.1**

	LOW RISK	INTERMEDIATE RISK	HIGH RISK
Colour	Normal colour of skin lips or tongue	Pallor	Pale / mottled / ashen / blue
Activity	Responds normally to social cues Content / smiles Stays awake or awakens quickly Strong normal cry / not crying	Not responding normally to social cues Wakes only with prolonged stimulation Decreased activity No smile	No response to social overtures Appears ill to a healthcare professional Unable to rouse or if roused does not stay awake

			Weak / high pitched /continuous cry
Respiratory		**Nasal flaring age <12 months** **Tachypnoea:** **RR >50bpm age 6-12months** **RR >40bpm age >12 months** **Oxygen saturation < 95% in air** **Crepitations**	**Grunting** **Tachypnoea** **RR > 60bpm** **Moderate to severe chest indrawing**
Hydration	**Normal skin and eyes** **Moist mucous membrane**	**Dry mucous membrane** **Poor feeding in infants *** **Capillary refill time (CRT) >=3 seconds** **Reduced urine output**	**Reduced skin turgor**
Other	**AND NONE** **OF THE AMBER OR RED SYMPTOMS OR SIGNS**		**Non blanching rash** **Bulging fontanelle** **Neck stiffness** **Focal neurological signs** **Focal seizures**

		Fever for >= 5 days	**Age 0-3months Temp >=38^{o} C** **Age 3-6months Temp >=39^{o} C**
		A new lump > 2cm	**Bile stained vomiting** **Swelling of a limb or joint** **Non weight bearing / not using an extremity**

Remote assessment

- Healthcare professionals performing a remote assessment should seek to establish the presence or absence of as many of the appropriate “traffic light” symptoms and signs as possible as part of their assessment of a child with fever. **1.3.1.1**
- Children who need an urgent face-to-face assessment should be seen within 2 hours. **1.3.1.4**

Management by the non-paediatric specialist

- Healthcare professionals should measure and record temperature, heart rate, respiratory rate and CRT as part of the routine assessment of a child with fever. **1.4.1.4**

Referral to paediatric specialist care

- If no diagnosis has been reached, healthcare professionals should provide a safety net for parents if any “amber” features are present. The safety net should be one or more of the following:
    - referral to specialist paediatric care for further assessment
    - liaising with other healthcare providers, including out of hour providers, to ensure direct access for the patient for a further assessment
    - arranging further follow up at a certain time and place

- providing the carer with verbal and written information on warning symptoms and how further healthcare can be accessed. **1.4.3.2**

Immediate treatment by non-paediatric specialist

- Oral antibiotics should not be prescribed to children with fever without focus. **1.4.4.1**

Children less than three months old

- Infants less than three months of age with fever greater than or equal to 38^{o}C should be admitted to hospital, observed and have the following vital signs measured and recorded:
    - Temperature
    - Heart rate
    - Respiratory rate **1.5.2.1**

Children greater or equal to 3 months old

GREEN Group

- Children with fever without apparent source who have no features of serious illness, should have urine collected by clean catch and tested for urinary tract infection (see UTIC guideline). They should also be assessed for signs and symptoms of pneumonia.
- Routine blood tests and chest x-rays on children with fever who appear well should not be performed.

AMBER Group

- For children with fever without apparent source who have one or more amber features:
    - Urine should be collected by clean catch and tested for urinary tract infection (see UTIC guideline)
    - Further investigations (CRP, WBC, blood cultures etc.) should be performed unless deemed unnecessary by an experienced paediatrician.

- Lumbar puncture should be considered for children less than one year of age.
- Chest x-ray is recommended for children with fever >39^{o}C and WBC >20x109/l.

RED Group

- For children with fever without apparent source presenting with one or more red features the following investigations should be performed:
    - Blood culture
    - Full blood count
    - Urine testing for urinary tract infection
    - CRP

The following investigations should also be considered, as guided by the clinical assessment:

- Lumbar puncture in children of all ages (if not contra-indicated)
- Chest x-ray irrespective of body temperature and WBC
- Serum electrolytes **1.4.3.2**

Antipyretics

- Antipyretic agents do not prevent febrile convulsions and should not be used for this purpose. **1.6.2.1**

1 Guidance

The following guidance is based on the best available evidence. The full guideline (www.nice.org.uk/XXX) gives details of the methods and the evidence used to develop the guidance (see section 5 for details).

1.1 Thermometers and detection of fever

1.1.1 Oral and rectal temperature measurements

1.1.1.1 The oral and rectal routes should not routinely be used to measure the body temperature of children aged 0 – 5 years.

1.1.2 Measurement of body temperature at other sites

1.1.2.1 In children aged four weeks to five years, healthcare professionals should measure body temperature by one of the following methods:

- Electronic thermometer in the axilla
- Chemical dot thermometer in the axilla
- Infra-red tympanic thermometer

1.1.2.2 Healthcare professionals should be aware that single use disposable chemical dot thermometers are not cost effective when patients require multiple temperature measurements.

1.1.2.3 In infants under the age of four weeks, body temperature should be measured with an electronic thermometer in the axilla.

1.1.2.4 Forehead crystal thermometers are unreliable and should not be used by healthcare professionals.

1.1.3 Subjective detection of fever by parents and carers

1.1.3.1 Reported parental perception of a fever should be considered valid and taken seriously by healthcare professionals.

1.2 Clinical assessment of child with fever

1.2.1 Non-specific symptoms and signs of serious illness

1.2.1.1 Children with the following symptoms or signs should be recognised as being in a high risk group for serious illness:

- Unable to rouse or if roused does not stay awake
- Weak / High pitched / continuous cry
- Pale / mottled / blue
- Reduced skin turgor
- Bile stained vomiting
- Moderate/severe chest indrawing
- Respiratory rate >60
- Grunting
- Bulging fontanelle
- Appears ill to a healthcare professional

1.2.1.2 Children with any of the following symptoms should be recognised as being in at least an intermediate risk group for serious illness:

- Wakes only with prolonged stimulation
- Decreased activity
- Poor feeding in infants
- Not responding normally to social cues / No smile
- Dry mucous membranes
- Reduced urine output
- A new lump >2cm
- Pallor reported by parent
- Nasal flaring

1.2.1.3 Children who have all of the following features, and none of the high or intermediate risk features, should be recognised as being in a low risk group for serious illness:

- Strong cry / no cry
- Content / smiles
- Stays awake
- Normal colour of skin, lips and tongue
- Normal skin and eyes
- Moist mucous membranes
- Normal response to social cues

1.2.1.4 Height of body temperature alone should not be used to identify children with serious illness. However, healthcare workers should be aware that children with a very high body temperature (> 39^{o}C) are at higher risk of serious illness.

1.2.1.5 Duration of fever should not be used to predict the likelihood of serious illness.

1.2.1.6 Kawasaki disease should be considered as a possible diagnosis in children with duration of fever of 5 days or over.

1.2.1.7 Healthcare professionals examining children with fever must measure and record heart rate as part of their routine assessment, because a raised heart rate can be a sign of serious illness, particularly septic shock.

1.2.1.8 Measurement of the capillary refill time (CRT) should form part of the routine assessment of the feverish child.

1.2.1.9 A CRT≥3 seconds should be recognised as an intermediate risk group marker for serious illness (amber sign).

1.2.1.10 Children with fever should be assessed for signs of dehydration

1.2.1.11 In assessing a child with fever for dehydration the healthcare professional should look for:

- Prolonged CRT
- Abnormal skin turgor

- Abnormal respiratory pattern
- Weak pulse
- Cool extremity.

1.2.2 Signs and symptoms of specific serious illnesses

1.2.2.1 Meningococcal disease should be considered in any child with fever and a non-blanching rash, and particularly if any of the following features are present:

- An ill looking child
- Lesions larger than 2 mm in diameter
- A capillary refill time of ≥ 3 seconds
- Neck stiffness.

1.2.2.2 Meningitis should be considered in a child with fever and any of the following features:

- Neck stiffness
- Bulging fontanelle
- Decreased conscious level.

1.2.2.3 Clinicians should be aware that classical signs of meningitis (neck stiffness, bulging fontanelle, high-pitched cry) are often absent in infants with bacterial meningitis.

1.2.2.4 Herpes simplex encephalitis should be considered in children with fever and the following:

- Focal neurological signs
- Focal seizures
- Decreased conscious level.

1.2.2.5 Pneumonia should be considered in children with fever and any of the following signs :

- Tachypnoea (respiratory rate >60 bpm age 0-5 months; RR>50 age 6-12months; RR>40 age >12months)
- Crepitations in the chest
- Nasal flaring
- Chest indrawing
- Cyanosis
- Oxygen saturations <= 95% in air. (1.4.3.)

1.2.2.6 Urinary tract infection should be considered in a child aged over four weeks with fever and one or more of the following:

- Vomiting
- Poor feeding
- Lethargy
- Irritability
- Abdominal pain or tenderness
- Urinary frequency or dysuria
- Offensive urine or haematuria.

1.2.2.7 Urinary tract infection should be considered in any child aged four weeks or under with fever.

1.2.2.8 Septic arthritis/osteomyelitis should be considered in children with fever and any of the following signs:

- Swelling of a limb or joint
- Not using an extremity
- Non-weight bearing.

1.2.2.9 Kawasaki disease should be considered in children with fever for more than five days and four of the following five features:

- Bilateral conjunctival injection
- Change in mucous membranes in the upper respiratory tract (eg injected pharynx, dry cracked lips or strawberry tongue)

- Change in the peripheral extremities (e.g. oedema, erythema or desquamation)
- Polymorphous rash
- Cervical lymphadenopathy.

1.2.2.10 Summary table for symptoms and signs of specific diseases.

Diagnosis to be considered	**Symptoms <u>in conjunction with fever</u>**
Meningococcal Disease	Non blanching rash PLUS one of: An ill looking child Lesions larger than 2 mm in diameter (purpura) A capillary refill time of >/= 3 seconds Neck stiffness
Meningitis	Neck stiffness Bulging fontanelle Decreased conscious level
Herpes simplex encephalitis	Focal neurological signs Focal seizures Decreased conscious level
Pneumonia	Tachypnoea (RR >60bpm age 0-5mths, RR>50 age 6-12mths; RR>40 age >12mths) Crepitations in the chest Nasal flaring in children under 12 months Chest indrawing Cyanosis Oxygen saturations ≤ 95%
Urinary tract infection	Vomiting Poor feeding Lethargy Irritability Abdominal pain or tenderness Urinary frequency or dysuria Offensive urine or haematuria
Septic arthritis	Swelling of a limb or joint Not using an extremity Non-weight bearing
Kawasaki disease	Fever for more than five days and at least four of the following: Bilateral conjunctival injection Change in mucous membranes Change in the peripheral extremities Polymorphous rash Cervical lymphadenopathy

1.2.3 Traffic light system

1.2.3.1 In addition to seeking a focus of infection in children with fever, healthcare professionals should look for the following symptoms and signs:

	LOW RISK	INTERMEDIATE RISK	HIGH RISK
Colour	**Normal colour of skin lips or tongue**	**Pallor reported by parent / carer**	**Pale / mottled / ashen / blue**
Activity	**Responds normally to social cues Content / smiles Stays awake or awakens quickly Strong normal cry / not crying**	**Not responding normally to social cues Wakes only with prolonged stimulation Decreased activity No smile**	**No response to social overtures Appears ill to a healthcare professional Unable to rouse or if roused does not stay awake Weak / high pitched /continuous cry**
Respiratory		**Nasal flaring age <12 months Tachypnoea: RR >50bpm age 6-12 months RR >40bpm age >12 months Oxygen saturation < 95% in air Crepitations**	**Grunting Tachypnoea RR > 60bpm Moderate to severe chest indrawing**
Hydration	**Normal skin and eyes Moist mucous membrane**	**Dry mucous membrane Poor feeding in infants* Capillary refill time (CRT) >=3 seconds Reduced urine output**	**Reduced skin turgor**
Other	**AND NONE OF THE AMBER OR RED SYMPTOMS OR SIGNS**		**Non blanching rash Bulging fontanelle Neck stiffness Focal neurological signs Focal seizures**

		Fever for >= 5 days	**Age 0-3months Temp >=38° C** **Age 3-6months Temp >=39° C**
		A new lump > 2cm	**Bile stained vomiting** **Swelling of a limb or joint** **Non weight bearing / not using an extremity**

1.2.4 Imported infections

1.2.4.1 When assessing a child with feverish illness, healthcare professionals should enquire about recent travel abroad and should consider the possibility of imported infections according to the region visited.

1.3 Management by remote assessment

1.3.1 Assessment

1.3.1.1 Healthcare professionals performing a remote assessment should seek to establish the presence or absence of as many of the appropriate “traffic light” symptoms and signs as possible as part of their assessment of a child with fever.

1.3.1.2 Children whose symptoms or combination of symptoms suggest immediate life threatening illness should be referred immediately for emergency medical care by the most appropriate means of transport (usually 999 ambulance).

1.3.1.3 Children with any “red” or “amber” features but who are not considered to have an immediately life threatening illness should be urgently assessed by a healthcare professional in a face-to-face setting.

1.3.1.4 Children who need an urgent face-to-face assessment should be seen within 2 hours.

1.3.1.5 Children with “green” features and none of the “amber” or “red” features can be confidently managed at home with appropriate self care advice and advice as to when to seek further attention from the health services.

1.3.1.6 In addition to seeking a focus of infection in children with fever, healthcare professionals should look for the following symptoms and signs:

	LOW RISK	INTERMEDIATE RISK	HIGH RISK
Colour	**Normal colour of skin lips or tongue**	**Pallor reported by parent / carer**	**Pale / mottled / ashen / blue**
Activity	**Responds normally to social cues Content / smiles Stays awake or awakens quickly Strong normal cry / not crying**	**Not responding normally to social cues Wakes only with prolonged stimulation Decreased activity No smile**	**No response to social overtures Appears ill to a healthcare professional Unable to rouse or if roused does not stay awake Weak / high pitched /continuous cry**
Respiratory		**Nasal flaring age <12 months Tachypnoea: RR >50bpm age 6-12 months RR >40bpm age >12 months Oxygen saturation < 95% in air Crepitations**	**Grunting Tachypnoea RR > 60bpm Moderate to severe chest indrawing**
Hydration	**Normal skin and eyes Moist mucous membrane**	**Dry mucous membrane Poor feeding in infants* Capillary refill time (CRT) >=3 seconds Reduced urine output**	**Reduced skin turgor**

Other	**AND NONE OF THE AMBER OR RED SYMPTOMS OR SIGNS**	**Fever for >= 5days** **A new lump >2cm**	**Non blanching rash** **Bulging fontanelle** **Neck stiffness** **Focal neurological signs** **Focal seizures** **Age 0-3months Temp >=38° C** **Age 3-6months Temp >=39° C** **Bile stained vomiting** **Swelling of a limb or joint** **Non weight bearing / not using an extremity**

1.4 Management by the non-paediatric specialist

1.4.1 Assessment and history taking

1.4.1.1 In addition to seeking a focus of infection in children with fever, the healthcare professional should look for the following symptoms and signs:

	LOW RISK	INTERMEDIATE RISK	HIGH RISK
Colour	**Normal colour of skin lips or tongue**	**Pallor reported by parent / carer**	**Pale / mottled / ashen / blue**
Activity	**Responds normally to social cues** **Content / smiles** **Stays awake or awakens quickly** **Strong normal cry / not crying**	**Not responding normally to social cues** **Wakes only with prolonged stimulation** **Decreased activity** **No smile**	**No response to social overtures** **Appears ill to a healthcare professional** **Unable to rouse or if roused does not stay awake** **Weak / high pitched /continuous cry**
Respiratory		**Nasal flaring age <12 months Tachypnoea:** **RR >50bpm age 6-12months** **RR >40bpm age >12**	**Grunting** **Tachypnoea** **RR > 60bpm** **Moderate to severe**

		months **Oxygen saturation < 95% in air** **Crepitations**	**chest indrawing**
Hydration	**Normal skin and eyes** **Moist mucous membrane**	**Dry mucous membrane** **Poor feeding in infants *** **Capillary refill time (CRT) >=3 seconds** **Reduced urine output**	**Reduced skin turgor**
Other	**AND NONE OF THE AMBER OR RED SYMPTOMS OR SIGNS**		**Non blanching rash** **Bulging fontanelle** **Neck stiffness** **Focal neurological signs** **Focal seizures**
		Fever for >= 5 days	**Age 0-3months Temp >=38° C** **Age 3-6months Temp >=39° C**
		A new lump > 2cm	**Bile stained vomiting** **Swelling of a limb or joint** **Non weight bearing / not using an extremity**

1.4.1.2 When assessing a child with fever, the healthcare professional should be mindful of the following symptoms and signs which are associated with serious specific illnesses.

Diagnosis to be considered	Symptoms in conjunction with fever
Meningococcal Sepsis	Non blanching rash PLUS one of: An ill looking child Lesions larger than 2 mm in diameter (purpura) A capillary refill time of >/= 3 seconds Neck stiffness
Meningitis	Neck stiffness Bulging fontanelle Decreased conscious level
Herpes simplex encephalitis	Focal neurological signs Focal seizures Decreased conscious level

Pneumonia	Tachypnoea (RR >60bpm age 0-5mths, RR>50 age 6-12mths; RR>40 age >12mths) Crepitations in the chest Nasal flaring in children under 12 months Chest indrawing Cyanosis Oxygen saturations ≤ 95%
Urinary tract infection	Vomiting Poor feeding Lethargy Irritability Abdominal pain or tenderness Urinary frequency or dysuria Offensive urine or haematuria
Septic arthritis	Swelling of a limb or joint Not using an extremity Non-weight bearing
Kawasaki disease	Fever for more than 5 days and at least 4 of the following: Bilateral conjunctival injection Change in mucous membranes Change in the peripheral extremities Polymorphous rash Cervical lymphadenopathy

1.4.1.3 Healthcare professionals examining children with fever must measure and record heart rate as part of their routine assessment because a raised heart rate can be a sign of serious illness particularly septic shock.

1.4.1.4 Healthcare professionals should measure and record temperature, heart rate, respiratory rate and CRT as part of the routine assessment of a child with fever.

1.4.1.5 Children with fever should be assessed for signs of dehydration.

1.4.1.6 In assessing a child with fever for dehydration, healthcare professionals should look for:

- Prolonged CRT
- Abnormal skin turgor

- Abnormal respiratory pattern
- Weak pulse
- Cool extremity

1.4.2 Tests by the non-paediatric specialist

1.4.2.1 Children with signs and symptoms suggesting pneumonia who are not admitted to hospital should not routinely have chest x ray.

1.4.2.2 Urinary tract infection should be considered in a child aged over four weeks with fever and one or more of the following:

- Vomiting
- Poor feeding
- Lethargy
- Irritability
- Abdominal pain or tenderness
- Urinary frequency or dysuria
- Offensive urine or haematuria

1.4.2.3 Urinary tract infection should be considered in any child aged four weeks or under with fever.

1.4.3 Referral to paediatric specialist care

1.4.3.1 A feverish child considered to have an immediately life threatening illness should be transferred without delay to the care of a paediatric specialist by the most appropriate means of transport (e.g. 999 ambulance).

1.4.3.2 In children with Red features
Children with any red features but who are not considered to have an immediately life threatening illness should be referred urgently to the care of a paediatric specialist.

In children with Amber features

If no diagnosis has been reached, healthcare professionals should provide a safety net for parents if any “amber” features are present. The safety net should be one or more of the following:

- referral to specialist paediatric care for further assessment
- liaising with other healthcare professionals, including out of hours providers, to ensure direct access for the patient for a further assessment
- arranging further follow up at a certain time and place
- providing the carer with verbal and written information on warning symptoms and how further healthcare can be accessed.

In children with Green features

Children with a feverish illness who have all of the following “green” features:

- Strong cry / no cry
- Content / smiles
- Stays awake
- Normal colour of skin, lips and tongue
- Normal skin and eyes
- Moist mucous membranes
- Normal response to social cues

and have NONE of the red or amber features, can be confidently managed at home with appropriate self care advice (Chapter 9) and guidance as to when to seek further medical care.

1.4.4 Immediate treatment by the non-paediatric specialist

1.4.4.1 Oral antibiotics should not be prescribed to children with fever without focus.

1.4.5 Empirical treatment with parenteral antibiotics

1.4.5.1 Children with suspected meningococcal disease should be given parenteral antibiotics at the earliest opportunity.

1.5 Management by paediatric specialist

1.5.1 History taking and examination

1.5.1.1 In addition to seeking a focus of infection in children with fever health care professionals should look for the following symptoms and signs:

	LOW RISK	INTERMEDIATE RISK	HIGH RISK
Colour	Normal colour of skin lips or tongue	Pallor	Pale / mottled / ashen / blue
Activity	Responds normally to social cues Content / smiles Stays awake or awakens quickly Strong normal cry / not crying	Not responding normally to social cues Wakes only with prolonged stimulation Decreased activity No smile	No response to social overtures Appears ill to a healthcare professional Unable to rouse or if roused does not stay awake Weak / high pitched /continuous cry

Respiratory		**Nasal flaring age <12 months** **Tachypnoea:** **RR >50bpm age 6-12months** **RR >40bpm age >12 months** **Oxygen saturation < 95% in air** **Crepitations**	**Grunting** **Tachypnoea** **RR > 60bpm** **Moderate to severe chest indrawing**
Hydration	**Normal skin and eyes** **Moist mucous membrane**	**Dry mucous membrane** **Poor feeding in infants *** **Capillary refill time(CRT) >=3 seconds** **Reduced urine output**	**Reduced skin turgor**
Other	**<u>AND NONE</u>** **OF THE AMBER OR RED SYMPTOMS OR SIGNS**		**Non blanching rash** **Bulging fontanelle** **Neck stiffness** **Focal neurological signs** **Focal seizures**
		Fever for >= 5 days	**Age 0-3months Temp >=38^{o} C** **Age 3-6months Temp >=39^{o} C**

		A new lump > 2cm	**Bile stained vomiting** **Swelling of a limb or joint** **Non weight bearing / not using an extremity**

- Summary table for symptoms and signs of specific diseases (7.2)

Diagnosis to be considered	**Symptoms <u>in conjunction with fever</u>**
Meningococcal Sepsis	Non blanching rash PLUS one of: An ill looking child Lesions larger than 2 mm in diameter (purpura) A capillary refill time of >/= 3 seconds Neck stiffness
Meningitis	Neck stiffness Bulging fontanelle Decreased conscious level
Herpes simplex encephalitis	Focal neurological signs Focal seizures Decreased conscious level

Pneumonia	Tachypnoea (RR >60bpm age 0-5mths, RR>50 age 6-12mths; RR>40 age >12mths) Crepitations in the chest Nasal flaring Chest indrawing Cyanosis Oxygen saturations <=95%
Urinary tract infection	Vomiting Poor feeding Lethargy Irritability Abdominal pain or tenderness Urinary frequency or dysuria Offensive urine or haematuria
Septic arthritis / osteomyelitis	Swelling of a limb or joint Not using an extremity Non-weight bearing
Kawasaki disease	Fever for more than five days and at least four of the following: Bilateral conjunctival injection Change in mucous membranes Change in the peripheral extremities Polymorphous rash Cervical lymphadenopathy

1.5.1.2 Healthcare professionals examining children with fever must measure and record heart rate as part of their routine assessment because a raised heart rate can be a sign of serious illness, particularly septic shock.

1.5.1.3 Healthcare professionals should measure and record temperature, heart rate, respiratory rate and CRT as part of the routine assessment of a child with fever.

1.5.1.4 Children with fever should be assessed for signs of dehydration.

1.5.1.5 In assessing a child with fever for dehydration, healthcare professionals should look for:

- Prolonged CRT
- Abnormal skin turgor
- Abnormal respiratory pattern
- Weak pulse
- Cool extremity

1.5.2 Children less than three months old

1.5.2.1 Infants less than three months of age with fever greater than or equal to 38^{o}C should be admitted to hospital, observed and have the following vital signs measured and recorded:

- Temperature
- Heart rate
- Respiratory rate

1.5.2.2 For infants less than three months of age with fever greater than or equal to 38^{o}C:

The following investigations should be performed:

- Full blood count
- Blood culture

- CRP
- Urine testing for urinary tract infection (see UTIC guideline)
- Chest x-ray only if respiratory signs are present
- Stool culture, if diarrhoea is present

1.5.2.3 Lumbar puncture should be performed on the following unless contra-indicated:

- Infants < 1 month
- Infants 1-3 months with WBC <5 or >15x10^9/l or abnormal CRP
- All infants 1-3 months who appear unwell.

1.5.2.4 When indicated, a lumbar puncture should be performed without delay and, wherever possible, before the administration of antibiotics.

1.5.2.5 Parenteral antibiotics should be given to:

- Infants < 1 month
- Infants 1-3 months with WBC <5 or >15x10^9/l or abnormal CRP
- All infants 1-3 months who appear unwell.

1.5.2.6 For infants less than three months of age, a third generation cephalosporin (e.g. cefotaxime or ceftriaxone) is appropriate PLUS an antibiotic active against Listeria (e.g. ampicillin or amoxicillin)

1.5.2.7 When a decision is made not to give antibiotics, observation should still be provided.

1.5.3 Children aged greater or equal to three months old

GREEN Group

1.5.3.1 Children with fever without apparent source who have no features of serious illness, should have urine collected by clean catch and

tested for urinary tract infection (see UTIC guideline). They should also be assessed for signs and symptoms of pneumonia.

1.5.3.2 Routine blood tests and chest x-rays on children with fever who appear well should not be performed.

AMBER Group

1.5.3.3 For children with fever without apparent source who have one or more amber features:

- Urine should be collected by clean catch and tested for urinary tract infection (see UTIC guideline)
- Further investigations (CRP, WBC, blood cultures etc.) should be performed unless deemed unnecessary by an experienced paediatrician.
- Lumbar puncture should be considered for children less than one year of age.
- Chest x-ray is recommended for children with fever >39^{o}C and WBC >20x10^{9}/l.

RED Group

1.5.3.4 For children with fever without apparent source presenting with one or more red features the following investigations should be performed:

- Blood culture
- Full blood count
- Urine testing for urinary tract infection (see UTIC guideline)
- CRP

1.5.3.5 The following investigations should also be considered, as guided by the clinical assessment:

- Lumbar puncture in children of all ages (if not contra-indicated)
- Chest x-ray irrespective of body temperature and WBC

- Serum electrolytes

1.5.3.6 Febrile children with proven RSV or influenza infection should be assessed for features of serious illness and consideration given to urine testing for urinary tract infection.

1.5.3.7 In children greater than three months old with fever without apparent source, a period of observation in hospital (with or without investigations) should be considered as part of an assessment to help differentiate non-serious from serious illness.

1.5.3.8 Children less than three months old with fever should be admitted and investigated.

1.5.3.9 When a child has been given antipyretics:

- Healthcare professionals should not rely on a decrease or lack of decrease in temperature after 1-2 hours to differentiate serious and non-serious illness.
- Children in hospital with amber or red features should be re-assessed after 1-2 hours.

1.5.4 Immediate treatment by paediatric specialist

1.5.4.1 Children with fever and shock presenting to specialist paediatric care or the emergency department should be:

- Given an immediate intravenous fluid bolus of 20ml/kg. The initial fluid should normally be 0.9% sodium chloride.
- Actively monitored and given further fluid boluses if necessary.

1.5.4.2 Children with fever presenting to specialist paediatric care or an emergency department should be given immediate parenteral antibiotics if they are:

- Shocked
- Unrousable

- Showing signs of meningococcal disease.

1.5.4.3 Immediate parenteral antibiotics should be considered for children with fever and reduced levels of consciousness. In these cases, signs and symptoms of meningitis and herpes encephalitis should be sought.

1.5.4.4 A third generation cephalosporin (e.g. cefotaxime or ceftriaxone) is appropriate, until culture results are available.

1.5.4.5 For infants less than three months of age, an antibiotic active against Listeria (e.g. ampicillin or amoxicillin) should be added.

1.5.4.6 Children with fever and symptoms and signs suggestive of herpes simplex encephalitis should be given immediate intravenous aciclovir.

1.5.4.7 Oxygen should be given to children with fever who have signs of shock or arterial oxygen saturation (SaO2) of less than 92% when breathing air.

1.5.4.8 Treatment with oxygen should be considered for children with lesser degrees of hypoxia as clinically indicated.

1.5.5 Causes and incidence of serious bacterial infection

1.5.5.1 In a child presenting to hospital with a fever and suspected serious bacterial infection, requiring immediate treatment, antibiotics should be directed against *Neisseria meningitidis, Streptococcus pneumoniae, Escherichia coli* and *Haemophilus influenzae* type b. A third generation cephalosporin (e.g. cefotaxime or ceftriaxone) is appropriate, until culture results are available. For infants less than 3 months of age an antibiotic active against Listeria (e.g. ampicillin or amoxicillin) should be added.

1.5.5.2 Clinicians should refer to local guidelines when rates of bacterial antibiotic resistance are significant.

1.5.6 Admission to hospital

1.5.6.1 If it is decided that a child does not need admission to hospital, but no diagnosis has been reached, a safety net should be provided for parents if any "red" or "amber" features are present. The safety net should be one or more of the following:

- ensuring direct access for the patient for a further assessment, including liaising with other healthcare providers
- arranging further follow up at a certain time and place
- providing the carer with verbal and written information on warning symptoms and how further healthcare can be accessed.

1.5.6.2 Children with a feverish illness who have all of the following “green” features:

- Strong cry / no cry
- Content / smiles
- Stays awake
- Normal colour of skin, lips and tongue.
- Normal skin and eyes
- Moist mucous membranes
- Normal response to social cues

and have NONE of the red or amber features, can be confidently managed at home with appropriate self care advice and guidance as to when to seek further medical care.

1.5.6.3 Healthcare professionals should consider the following factors, as well as the child’s clinical condition, when deciding whether to admit a child with fever to hospital:

- Social and family circumstances
- Other illnesses suffered by the child or other family members
- Parental anxiety and instinct (based on their knowledge of their child)

- Contacts with other people who have serious infectious diseases
- Recent travel abroad to tropical/sub tropical areas, or areas with a high risk of endemic infectious disease.
- When the parent or carer's concern for their child's current illness has caused them to seek help repeatedly
- Where the family has experienced a previous serious illness or death due to feverish illness which has increased their anxiety levels
- When a feverish illness has no obvious cause, but the child remains ill longer than expected for a self-limiting illness.

1.5.7 Suspected meningococcal disease

1.5.7.1 Children with suspected meningococcal disease should be given parenteral antibiotics at the earliest opportunity.

1.5.7.2 Children admitted to hospital with meningococcal disease should be under paediatric care, supervised by a consultant and their need for inotropes assessed.

1.6 Antipyretic interventions

1.6.1 Physical and drug interventions

1.6.1.1 Tepid sponging is not recommended for the treatment of fever.

1.6.1.2 Children with fever should be clothed appropriately for the ambient temperature.

1.6.1.3 Children with fever should not be underdressed or over wrapped.

1.6.1.4 Antipyretic drugs should be offered to children who are miserable with fever because they may make them feel better.

1.6.1.5 Either paracetamol or ibuprofen can be used to reduce temperature in children with fever.

1.6.1.6 Paracetamol and ibuprofen should not be administered at the same time to reduce temperature.

1.6.1.7 Paracetamol and ibuprofen should not routinely be given alternately to reduce temperature.

1.6.2 Effects of body temperature reduction

1.6.2.1 Antipyretic agents do not prevent febrile convulsions and should not be used for this purpose.

1.7 Advice for home care

1.7.1 Care at home

1.7.1.1 Children with fever should be clothed appropriately for the ambient temperature.

1.7.1.2 Children with fever should not be not underdressed or over wrapped.

1.7.1.3 Tepid sponging is not recommended for the treatment of fever.

1.7.1.4 Antipyretics should be offered to children who are miserable with fever because they make them feel better.

1.7.1.5 Either paracetamol or ibuprofen can be used to reduce temperature in children.

1.7.1.6 Paracetamol and ibuprofen should not be administered at the same time to reduce temperature.

1.7.1.7 Paracetamol and ibuprofen should not routinely be given alternately to reduce temperature.

1.7.1.8 Antipyretic agents do not prevent febrile convulsions and should not be used for this purpose.

1.7.1.9 The parents/carers looking after a feverish child at home should be advised:

- To offer the child regular fluids (where a baby or child is breastfed the most appropriate fluid is breastmilk)

- To check their child during the night.
- How to detect signs of dehydration looking for the following features:-
  - Sunken fontanelle
  - Dry mouth
  - Sunken eyes
  - Absence of tears
  - Poor overall appearance
- To keep their child away from nursery or school while the child's fever persists but to notify the school or nursery of the illness.

1.7.2 When to seek further help

1.7.2.1 Following contact with a healthcare professional, parents/carers who are looking after their feverish child at home, should seek further advice if:-

- The child suffers a fit
- The parent/carer feels that the child is less well than when they previously sought advice
- They are more worried than when they previously sought advice
- The fever lasts longer then five days
- The parent/carer is very distressed or unable to cope with their child's illness

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/NICEtoadddetails.

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 which 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 Predictive values of Heart rate

A study to confirm normal ranges for heart rate at different body temperatures and to determine if children with heart rates outside these ranges are at higher risk of serious illness. (4.2.4.1)

Why this is important

Heart rate is one of the commonly used markers of serious illness both in children and adults, yet there is no evidence to support the use of heart rate as a sign of serious illness in children with a fever. Heart rate is an easy parameter to measure manually or electronically. It is used as a baseline observation in both primary and secondary care settings. There is currently no evidence to support the ranges of normal heart rates in well children less than the age of 5 years. There is no evidence in this age group to explain what happens to the heart rate in children with different body temperatures who have a non-serious illness. There is no evidence to determine if a heart rate above or below a certain level can help predict the presence of serious illness for a given body temperature. Without such data, knowing how to best interpret the findings in children with fever is not evidence-based and a potential simple tool to detect those at high risk of serious illness remains undeveloped.

4.2 Remote assessment

The GDG recommends that a UK study is undertaken to determine the validity of symptoms reported on remote assessment for children with fever.

Why this is important

Traditionally symptomatic patients have been assessed in a face to face setting but increasingly remote assessment (assessment over the telephone) determines the urgency of the patient's need, the level of care advised and from that the most appropriate next step for the patient. This might include referral to emergency services, referral to acute or non acute services or closing the call with self care advice/support. Clinical and cost effectiveness will only be achieved through remote assessment if perceived need equates to actual need. There is currently poverty of data available which demonstrates either the validity of remote assessment.

4.3 Referral patterns

The GDG recommends that research is carried out on referral patterns between primary and secondary care for children with fever, so the health economic impact of this and future guidelines can be estimated.

Why this is important

GP's in their traditional gate-keeping role are often ambivalent about their referral threshold for sick children. Concern about the child is balanced with real concerns about not wasting precious NHS resources or perhaps placing a "well" child at iatrogenic risk unnecessarily. Changing the pattern of referral between primary and secondary care could have a potentially large impact on the effectiveness of care if more children are correctly diagnosed and those needing health care are treated sooner. If a change in criteria for referral to specialist care leads to a higher number of new referrals, this may be a very good use of NHS resources if it decreases the risk of long-term morbidity and mortality in this patient group. Health care resources should be focussed on areas of clinical care where they do the most good, either in primary, community or secondary care. Concern that an increase in referrals to secondary care will increase NHS costs may therefore be missing the point. What is needed is an analysis of the likely change in resource use (costs) and health outcomes resulting from changing the criteria for referral to specialist care.

4.4 Diagnosis

The GDG recommends that a UK study of the performance characteristics and cost-effectiveness of procalcitonin vs. CRP in identifying serious bacterial infection (SBI) in children with fever without apparent source be carried out.

Why this is important

Many young children with fever appear well with no symptoms or signs of serious illness. The vast majority of these children will have self-limiting illnesses. However a few will have serious bacterial infections which may not be identifiable by clinical assessment alone. Investigations which help to identify these children with serious bacterial infections could lead to prompt antibiotic treatment, which may improve their outcome. These investigations need to be both sensitive and specific so that most serious bacterial infections are identified and so that antibiotics are not given to children who don't need them. The inflammatory markers C-reactive protein and Procalcitonin have shown varying performance characteristics for identifying bacterial infection in a variety of populations. If either or both were found both sensitive and specific for identifying serious bacterial infection in children with fever without apparent source they would be more widely used. The cost effectiveness of this approach would thus need to be calculated.

4.5 Antipyretics

The GDG recommends that studies are conducted in primary care and secondary care to determine whether examination or re-examination after a dose of anti-pyretic medication is of benefit in differentiating children with serious illness from those with other conditions. (7.4.4)

Why this is important

Antipyretic medications are widely used in primary and secondary settings by parents and health care professionals. Children may therefore present to health care facilities having had a dose of antipyretics. Furthermore the child's response to antipyretic drugs may be used as an indication of severity of illness, the rationale being that those with milder illness will either show greater improvement in condition or greater defeveresence than other children. However, it is not clear if such changes in condition are a valid and

reliable method of differentiating children with serious illness from those with less serious conditions

5 Other versions of this guideline

5.1 Full guideline

The full guideline, Feverish illness in children, contains details of the methods and evidence used to develop the guideline. It is published by the National Collaborating Centre for Women 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 our website (www.nice.org/CGXXXquickrefguide).

For printed copies, phone the NHS Response Line (telephone 0870 1555 455; quote reference number NXXXX). **[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

Urinary Tract Infection in Children. *NICE clinical guideline* no. [number] (2006). Available from www.nice.org/CGXXX

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

- [Title of guideline]. NICE clinical guideline. (Publication expected [month year].)
- [Title of appraisal]. NICE technology appraisal guidance. (Publication expected [month year].)
- [Title of interventional procedure]. NICE interventional procedure guidance. (Publication expected [month year].)
- [Title of public health intervention guidance]. NICE public health intervention guidance. (Publication expected [month year].)
- [Title of public health programme]. NICE public health programme guidance. (Publication expected [month year].)

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

Algorithms are being published as a separate file on the website.