Caring for children with fever

RCN good practice guidance for nurses working with infants, children and young people
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Kathy Bridgewater, Bank Staff Nurse, Shrewsbury and Telford Hospitals NHS Trust

Dr Margaret Fletcher, Reader in Children's Nursing, University of the West of England

Heather–Elizabeth Hatter, Paediatric Nurse Educator, Imperial College Healthcare NHS Trust

Jane Houghton, Nurse Consultant Child Health, Lancashire Teaching Hospitals NHS Foundation Trust

Corinna Mason, Clinical Nurse Specialist, Birmingham Children's Hospital NHS Trust

Jayne Monaghan, Matron – Child Health, Bolton Hospitals NHS Trust

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Introduction

This good practice guidance aims to help every nurse give up-to-date, evidence-based care to infants, children and young people who are experiencing fever. The information is based on the clinical guideline *Feverish illness in children* (NICE, 2013) and other recently published papers. It contains information on commonly used nursing interventions, in particular the use of antipyretics and tepid sponging.

You will find the guidance helpful if you are a practitioner working with infants, children and young people, in either a community or hospital setting. We strongly recommend, however, that you also read NICE’s guidance *Feverish illness in children*, and integrate into your practice the ‘traffic light’ system for identifying risk of serious illness which is described in that document.

**Note:** Throughout this guidance the terms child and children have been used to include infants, children and young people.

Fever in children

A raised temperature is a symptom seen frequently by practitioners working with infants, children and young people. Fever is a common event and is often an indication of a self-limiting viral infection, rather than a bacterial or serious illness. However, each year 100 infants aged one–12 months die from infection and it is likely this number could be reduced by improved recognition, evaluation and treatment of febrile (fever-related) illness (NICE, 2013).

The cause of fever can be difficult to identify and it can be an indicator of a major illness such as meningitis, septicaemia, urinary tract infection or pneumonia.

Several studies reported that health professionals often perceive fever to be harmful and that nurses can be confused about the risks and benefits associated with fever (Walsh et al., 2005). Nurses and parents are often fearful that a fever will lead to febrile convulsions (Purssell, 2000). Walsh et al., (2005) reported that ‘fever phobia’ can result in interventions that do not reflect current knowledge and as a result, may be inconsistent, inappropriate and ineffective.

**Table 1: Normal temperatures in children**

<table>
<thead>
<tr>
<th>Age</th>
<th>Temperature (° Celsius)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 months</td>
<td>37.5</td>
</tr>
<tr>
<td>6 months</td>
<td>37.5</td>
</tr>
<tr>
<td>1 year</td>
<td>37.7</td>
</tr>
<tr>
<td>3 years</td>
<td>37.2</td>
</tr>
<tr>
<td>5 years</td>
<td>37.0</td>
</tr>
<tr>
<td>7 years</td>
<td>36.8</td>
</tr>
<tr>
<td>9 years</td>
<td>36.7</td>
</tr>
<tr>
<td>11 years</td>
<td>36.7</td>
</tr>
<tr>
<td>13 years</td>
<td>36.6</td>
</tr>
</tbody>
</table>

This table was published in *Growth and development of children*, 8th edition, Lowery, GH. Copyright Elsevier (1986).
Fever can be defined as: *an elevation of body temperature above the normal daily variation* (NICE, 2007).

Most fevers are self-limiting and many children readily tolerate temperatures of 39°C. Uncomplicated fever is relatively harmless and is an important immunological defence mechanism (JBI EBNM, 2001). When associated with infection, fever seldom exceeds 40°C and poses a negligible risk of brain injury (Casey, 2000).

The regulation of body temperature involves a complex series of physiological responses (Broom, 2007). In the brain, the hypothalamus regulates temperature like an internal thermostat. The level or set-point of this thermostat can be reset by substances known as pyrogens, resulting in the development of fever. When the set point in the hypothalamus is reset to a higher position, the blood flowing through the hypothalamus is perceived as being below the correct temperature, triggering mechanisms to conserve and generate heat (Casey, 2000).

Factors other than the underlying cause of fever can also influence body temperature. Heat and humidity in the surrounding environment can reduce the amount of heat lost through the skin and a reduction in circulating blood volume, as the result of haemorrhage or dehydration, can cause the temperature to increase (Casey, 2000).

It is an essential part of nursing care that you understand the process of temperature control and take appropriate steps to identify if a child’s fever may be a sign of severe illness. It will help you provide optimum care to review your knowledge and understand the patho-physiology of fever.
Assessing a child with a fever

<table>
<thead>
<tr>
<th>Traffic light system for identifying risk of serious illness*</th>
<th>Green – low risk</th>
<th>Amber – intermediate risk</th>
<th>Red – high risk</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Colour (of skin, lips or tongue)</strong></td>
<td>Normal colour</td>
<td>Pallor reported by parent/carer</td>
<td>Pale/mottled/ashen/blue</td>
</tr>
<tr>
<td><strong>Activity</strong></td>
<td>Responds normally to social cues</td>
<td>Not responding normally to social cues</td>
<td>No response to social cues</td>
</tr>
<tr>
<td></td>
<td>Content/smiles</td>
<td>No smile</td>
<td>Appears ill to a healthcare professional</td>
</tr>
<tr>
<td></td>
<td>Stays awake or awakens quickly</td>
<td>Wakes only with prolonged stimulation</td>
<td>Does not wake or if roused does not stay awake</td>
</tr>
<tr>
<td></td>
<td>Strong normal cry/not crying</td>
<td>Decreased activity</td>
<td>Weak, high-pitched or continuous cry</td>
</tr>
<tr>
<td><strong>Respiratory</strong></td>
<td>Nasal flaring</td>
<td>Tachypnoea: RR &gt;50 breaths/minute, age 6–12 months</td>
<td>Grunting</td>
</tr>
<tr>
<td></td>
<td>Tachypnoea: RR &gt;40 breaths/minute, age &gt;12 months</td>
<td>Oxygen saturation ≤95% in air</td>
<td>Tachypnoea: RR &gt;60 breaths/minute</td>
</tr>
<tr>
<td></td>
<td>Cracks in the chest</td>
<td>Moderate or severe chest indrawing</td>
<td></td>
</tr>
<tr>
<td><strong>Circulation and hydration</strong></td>
<td>Normal skin and eyes</td>
<td>Tachycardia:</td>
<td>Reduced skin turgor</td>
</tr>
<tr>
<td></td>
<td>Moist mucous membranes</td>
<td>&gt;160 beats/minute, age &lt;12 months</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt;150 beats/minute, age 12–24 months</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt;140 beats/minute, age 2–5 years</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CRT ≥3 seconds</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dry mucous membranes</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Poor feeding in infants</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reduced urine output</td>
<td></td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>None of the amber or red symptoms or signs</td>
<td>Age 3–6 months, temperature ≥39°C</td>
<td>Age &lt;3 months, temperature ≥38°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fever for ≥5 days</td>
<td>Non-blanching rash</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rigors</td>
<td>Bulging fontanelle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Swelling of a limb or joint</td>
<td>Neck stiffness</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Non-weight bearing limb/not using an extremity</td>
<td>Status epilepticus</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Focal neurological signs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Focal seizures</td>
</tr>
</tbody>
</table>

* This traffic light table should be used in conjunction with the recommendations in the guideline on investigations and initial management in children with fever. See [http://guidance.nice.org.uk/CG160](http://guidance.nice.org.uk/CG160) (update of NICE clinical guideline 47).
When you are faced with a child with a fever, it is important to check for any immediate signs that are life-threatening - airway, breathing or circulation problems (ABC) or any decreased level of consciousness (Resuscitation Council, 2005). The NICE guidance (2007) describes a traffic light system for assessing the child with a fever. Using it can help you ensure that a child receives prompt and appropriate management of their fever. You should also take seriously and treat as valid the child's parent or carer's perceptions of their child's fever (NMC, 2008).

In children from four weeks to five years of age use:
- electronic thermometer in axilla
- chemical dot thermometer in axilla
- infra-red tympanic thermometer.

Do not routinely use the oral and rectal route for measuring temperature in children from 0– five years.

An electronic thermometer under the axilla is recommended for infants under four weeks of age.

Measure and record temperature, heart rate, respiratory rate and capillary refill time (CRT) as part of the routine assessment of a child with a fever.

If you routinely use chemical dot thermometers you should consider using an alternative type when multiple measurements are required.

Caution must be used with forehead thermometers as these are unreliable.

Measure the blood pressure of a child with fever if heart rate or CRT is abnormal.

Do not use the height of temperature in children older than six months to identify serious illness.

Children with fever will often feel tired, have a general malaise, look pale and have a poor appetite (Broom, 2007). Their pulse and respiratory rates will be raised, their hands and feet feel cold and their trunk will be warm. They may complain of feeling cold and may shiver. However, these symptoms may not reflect the height of the child’s temperature.

When a child feels warm to the touch you should measure their temperature, even if it was normal a short time before (Hockenberry, Wilson, Winkelstein, Kline, 2003). Use an electronic or chemical dot thermometer placed in the axilla, or an infra-red tympanic thermometer (NICE, 2013; RCN, 2011). The duration and height of a temperature, however, are not effective indicators for identifying children with serious illness (NICE, 2013).

### When fever is more significant

Fever can be more significant in some children. You will need to seek medical advice (Broom, 2007) when there is evidence of:
- fever greater than 41°C
- known bacterial sepsis
- sickle cell anaemia
- suppressed immunity
- congenital heart disease
- a severe head injury.

### High risk

Children with the following symptoms have a higher risk of serious illness. You must seek urgent medical advice where the child shows any of the following signs:
- unable to rouse, or if roused does not stay awake
- weak, high pitched or continuous cry
- pale, mottled, blue, ashen
- reduced skin turgor
- bile-stained vomiting
- moderate or severe chest indrawing
- respiratory rate above 60 breaths/minute
- grunting
- bulging fontanelle
- appears unwell.

### Other checks

As well as measuring the child’s temperature, you should also assess and record the other vital signs of heart rate, respiratory rate and capillary refill time. If the child shows signs of circulatory problems such as an abnormal heart rate or a prolonged capillary refill time, you should measure their blood pressure. There is information about good practice in assessing and measuring vital signs in the RCN document Standards
for assessing and recording vital signs in infants, children and young people (RCN, 2013).

If a child has recently travelled abroad, consider whether he/she could have an imported infection. If the fever persists for five days, you should seek medical advice so that the underlying cause of the fever can be identified (NICE, 2013).

Febrile convulsions

Febrile convulsion is a common outcome of childhood febrile illness (Purssell, 2000) and the risk is a key concern for nurses and parents. Between the ages of six months and three years, three per cent of children experience a febrile convulsion – the reason for this is unclear (Glasper and Richardson, 2006).

Febrile convulsions are very frightening for parents, but adverse effects are rare and the risk of neurological damage is low. Episodes of febrile convulsions usually last for less than two minutes, but if they last longer, further investigation may be warranted (Lissaur and Clayden, 2001). Research studies have shown that children aged six to twelve suffer no long-term effects to their health or intellect following a febrile convulsion (Hutt et al., 1999; Chang et al., 2001).

The use of antipyretics or other cooling methods rarely, if ever, prevent initial or recurrent febrile convulsions (Van Stuijvberg et al., 1998) and they should not be used specifically for this purpose (NICE, 2013).
Providing care

Uncomplicated fever is relatively harmless, but it is an important immunological defence (Watts et al., 2003), so a mild temperature in an otherwise healthy child should probably be allowed to run its course (Casey, 2000).

Specific nursing interventions aimed at reducing the child’s temperature will not affect the outcome of the underlying illness (Trigg and Mohammed, 2006). So you should aim your care at supporting the body’s natural physiological responses (Watts, 2003) and improving the child’s comfort (Trigg and Mohammed, 2006).

Where possible, parents or carers of children in hospitals should assist with nursing care such as feeding and bathing. This may be particularly useful in situations of high anxiety such as febrile convulsions (JIBE BNM, 2001).

Antipyretics

Antipyretics, such as paracetamol and ibuprofen, are commonly used to reduce a child’s temperature. They are particularly useful if a child is distressed because of a fever, but should not be used routinely for the sole purpose of reducing body temperature. It is important that you are aware that these medicines will not affect the cause of the fever – but they may help the child to feel more comfortable (O’Connor, 2002). Antipyretics can also mask other symptoms and make diagnosis of the underlying cause difficult (JIBE BNM, 2001).

In most children and young people, paracetamol and ibuprofen are unlikely to cause harm when they are used at the correct doses for short periods (DTB, 2008). Confusion caused by using brand names for over-the-counter analgesics can create the potential for the correct doses to be exceeded. It is very important that you and the child’s parents keep accurate records of what the child has taken, both in hospital and at home. You could give parents a simple tick chart to use at home, to increase safety.

Note: because of the risk of gastric bleeding and ulceration, you should avoid giving ibuprofen to high risk children. For example, a dehydrated child with cerebral palsy may be given paracetamol, as ibuprofen can cause renal failure or impairment (DHB, 2008).

Tepid sponging

There are various reasons why we do not recommend that you use tepid sponging:
- there is a lack of evidence to support its routine use in temperate climates such as the UK, because the sponging does not produce a sustained drop in temperature (JIBE BNM, 2001)
- it leads to vasoconstriction, which can result in a further rise in a child’s temperature (O’Connor, 2002)
- if performed too quickly, sponging can cause a child to shiver and have an increase in metabolic rate. This will subsequently increase their temperature (Glasper and Richardson, 2006).

The process is also very time-consuming for nurse or carer. There are some situations where a lukewarm bath may help a child feel more comfortable and soothed, particularly if their parents can give the bath. However, the water temperature should not induce shivering.

Environment

A room temperature of 18°C is comfortable and best measured by a room thermometer. Note that infants do not need a hot room, and all-night heating is rarely necessary (DH/FSID, 2007). You can reduce a room’s temperature by opening a window or using a fan (directing the fan away from the child as the cold air can induce shivering and a resultant rise in temperature).

Clothing

Children should not be underdressed or overwrapped. You can make a child more comfortable by reducing the amount of clothing they are wearing and reducing bedding (Trigg and Mohammed, 2006). Sheets and blankets may be cooler than a duvet so are safer for children under one year old. Infants lose excess heat from their heads and it is important to keep their heads uncovered when they have a fever (DH/FSID, 2007).
Hydration

It is important that you watch for signs of dehydration, particularly:

- a prolonged capillary refill time of three seconds or longer
- abnormal skin turgor
- abnormal respiratory pattern
- weak pulse
- cool extremities
- reduced urine output.

To prevent dehydration, encourage the child to drink cool drinks. Breast feeding should continue.

Record keeping

You should observe a child with a fever regularly. It is common practice to record a temperature one hour after giving antipyretics. The frequency that you take and record the child’s temperature should be in accordance with local policies, but should reflect the level that their temperature varies from the normal range.

Records should include comments on the child’s behaviour, overall condition and parents/carers’ observations (RCN, 2013).
Children in hospital

Some children with fever will require admission to hospital for further assessment, investigation and treatment.

Children who are already in hospital for other reasons may develop a fever as the result of viral, bacterial or physiological disturbance such as dehydration, surgery or head injury. In these circumstances, you must always seek medical advice.

Your priorities for when and how you should intervene will be guided by the child’s overall condition and by local guidelines, but you may find this guidance useful in developing a care plan.

Summary

Fever in infants, children and young people is common and in most instances there will be no adverse consequences. However, for some, particularly in infants and young children, fever can be an indicator of severe illness. By adopting an evidence-based approach to nursing interventions, you can ensure children receive appropriate and effective care and that you give parents/carers accurate information.

Every nurse working with children and young people should study the NICE guidance on Feverish illness in children (2013) and RCN Standards for assessing and recording vital signs in infants, children and young people and ensure these are reflected in local protocols.
References


**Further reading**


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