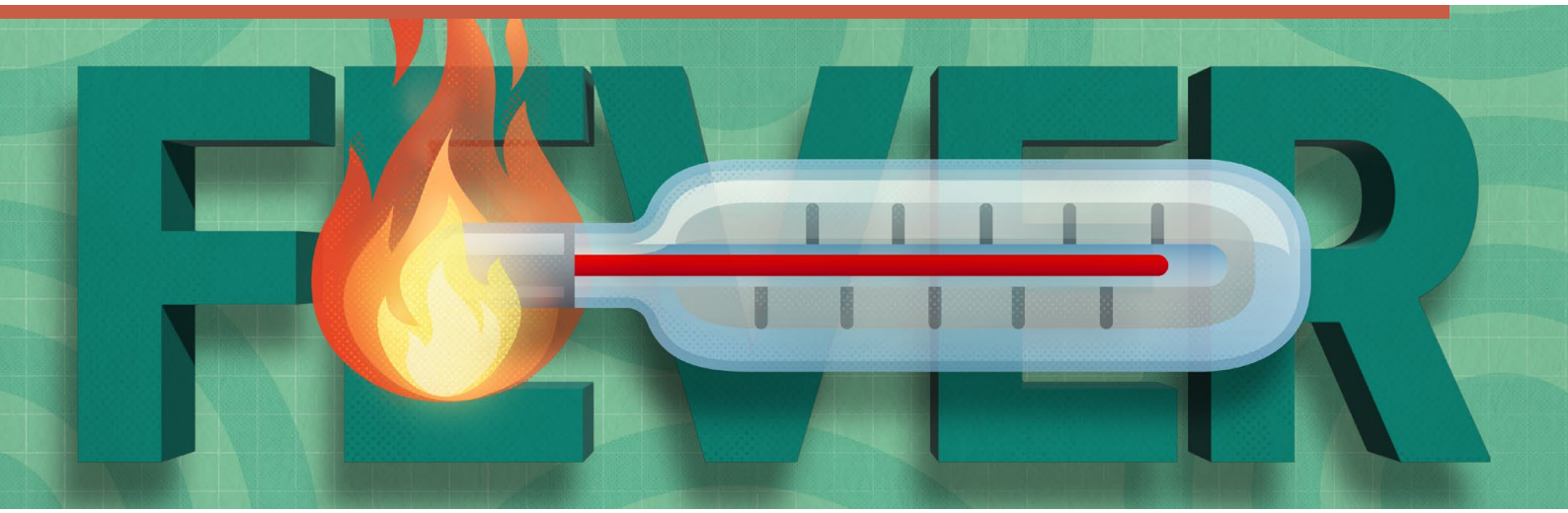

Identifying the risk of **serious illness in young children with fever**

Symptoms and signs for assessing the risk of serious illness in children aged under five years presenting with fever.

This is a revision of a previously published article. What's new for this update:

- General revision to align with updated NICE guidance for fever in under 5s (2019; updated 2021)
- The addition of guidance from the NICE suspected sepsis guideline (2016; updated 2024)

Approach to a child aged under five years with fever:

1. **Identify any immediately life-threatening signs,** e.g. airway, breathing or circulatory compromise, decreased level of consciousness; call an ambulance if any of these signs are present
2. **Assess the risk of serious illness** based on the presence or absence of specific symptoms and signs. Sepsis should be considered as a cause of fever in young children (however, fever may not be present in all cases of sepsis); follow the NICE suspected sepsis pathway* to stratify the risk of severe illness (see Table below). Other serious causes of fever in young children that should be considered include meningococcal disease, bacterial meningitis, herpes simplex encephalitis, pneumonia, urinary tract infection, septic arthritis and Kawasaki disease. Subsequent management is guided by the risk of serious illness: moderate to high risk = review; high risk = refer.
   - Measure and document **temperature** (taken in the axilla or using an infrared tympanic thermometer), **heart rate**, **respiratory rate** and **capillary refill time**. If the child's respiratory rate is elevated for their age or there is increased work of breathing, measure **oxygen saturation**. If the heart rate or capillary refill time is abnormal, measure **blood pressure**.

     For a guide to measuring blood pressure in unwell children, see: **www.hqsc.govt.nz/resources/resource-library/guide-to-recording-blood-pressure-in-acutely-unwell-tamariki-he-aratohu-hei-tuhi-i-te-taukapa-o-te-toto-i-te-tamariki-e-mauiui-ana/**. A video is also available here: **www.hqsc.govt.nz/resources/resource-library/video-how-to-take-blood-pressure-accurately-in-unwell-children/**.
   - In children aged six months and over, elevated temperature alone is a poor predictor of the risk of serious illness and evaluation of all vital signs is essential
   - Consider and account for any learning difficulties or disabilities in the child when assessing symptoms and signs. Co-morbidities, such as type 1 diabetes or severe asthma may also alter the significance of symptoms and signs.
   - Many children will have fever, but no obvious identifiable cause, and it can be difficult in younger children to distinguish between a life-threatening bacterial infection and a self-limiting viral illness that can be managed in the community; prioritise clinical judgment and experience

* The National Paediatric Early Warning System (PEWS) is used in some hospitals in New Zealand to recognise clinical deterioration in this setting: **www.hqsc.govt.nz/our-work/improved-service-delivery/patient-deterioration/workstreams/paediatric-early-warning-system/**.

Category	Age	Moderate to high risk (**Any** of the following features)	High risk (**Any** of the following features)
Behaviour	Any	■ Abnormal response to social cues ■ No smile ■ Only wakes with prolonged stimulation ■ Decreased level of activity ■ Concern reported by parent/carer that the child is behaving differently from normal	■ No response to social cues ■ Appears unwell to a clinician ■ Does not wake or does not stay awake if roused ■ Abnormal cry, e.g. weak, high pitched or continuous
Respiratory	Any	■ Nasal flaring ■ Oxygen saturation < 92% (or increased oxygen requirement compared to baseline) Also consider: ■ Chest signs on auscultation, e.g. crackles	■ Grunting ■ Apnoea ■ Oxygen saturation < 90% (or increased oxygen requirement compared to baseline) Also consider: ■ Moderate to severe chest indrawing
	< 1 year	■ RR 50 – 59 breaths/minute	■ RR ≥ 60 breaths/minute
	1 – 2 years	■ RR 40 – 49 breaths/minute	■ RR ≥ 50 breaths/minute
	3 – 4 years	■ RR 35 – 39 breaths/minute	■ RR ≥ 40 breaths/minute
Circulation and hydration	Any	■ Capillary refill time ≥ 3 seconds ■ Reduced urine output Also consider: ■ Dry mucous membranes ■ Poor feeding (infants)	■ Bradycardia: HR < 60 bpm Also consider: ■ Reduced skin turgor
	< 1 year	■ HR 150 – 159 bpm	■ HR ≥ 160 bpm
	1 – 2 years	■ HR 140 – 149 bpm	■ HR ≥ 150 bpm
	3 – 4 years	■ HR 130 – 139 bpm	■ HR ≥ 140 bpm
Skin, lips and tongue	Any	■ Pallor	■ Mottled or ashen ■ Cyanosis ■ Non-blanching rash (petechial or purpuric)
Temperature	Any	■ Temperature ≥ 39°C in a child aged 3 – 6 months	■ Temperature < 36°C ■ Temperature ≥ 38°C in a child aged < 3 months Also consider: ■ Some vaccinations may induce fever in children aged < 3 months. However, if the child is otherwise well, observation only is likely to be appropriate.
Other	Any	■ Leg pain ■ Cold hands or feet Also consider: ■ Fever for ≥ 5 days ■ Rigors ■ Limb or joint swelling ■ Non-weight bearing limb or not using an extremity	Also consider: ■ Bulging fontanelle ■ Neck stiffness ■ Status epilepticus ■ Focal neurological signs ■ Focal seizures
Action		**Review**	**Refer**

RR = respiratory rate; HR = heart rate; bpm = beats per minute

3. **Refe**r if ANY symptoms or signs in the high risk column:
   1. Immediately life-threatening illness – call an ambulance
   2. All other situations – to be assessed urgently in secondary care (ideally within two hours)

   Review if ANY symptoms or signs in the moderate to high risk column, but NONE in the high risk column:
   1. Diagnosis established (e.g. meningococcal disease, bacterial meningitis, herpes simplex encephalitis, pneumonia, urinary tract infection, septic arthritis, Kawasaki disease) or any suggestion of sepsis – manage accordingly; this may require referral to hospital
   2. No diagnosis – if there are some concerning features or if there are practical factors, e.g. live rurally, lack of reliable observation at home, refer to secondary care for further assessment or provide parent/carer with verbal and written information on warning symptoms/signs and ensure they know how and when to access further health care after hours. Arrange a follow-up appointment (in person or via phone).

   If the child has NONE of the features in either column:
   - Provide parent/carer with advice on symptomatic management at home (see below) and information on warning symptoms and signs and ensure they know how and when to access further health care if there are any concerns

   Always "safety net"
   Put protective measures in place so that if the child were to deteriorate at home or if symptoms persist, further health care will be sought. This may include information on warning symptoms and signs and instructions on what to do if the child's condition deteriorates, and an arrangement for follow-up, either in person or via phone. Do not underestimate the importance of clinical judgement and experience when assessing young children with fever. Also consider the level of concern of the parent/caregiver.

4. **Advice for care at home:**

Managing child's temperature	Care at home	When to seek further help
■ Give paracetamol or ibuprofen if the child appears distressed ■ Consider changing to ibuprofen if using paracetamol (and vice versa) if the child's distress is not alleviated ■ Consider the use of both paracetamol and ibuprofen if the child's distress is not alleviated with either alone. Alternate or stagger the dosing and note difference in dosing intervals, e.g. start on four-hourly paracetamol and then in two hours, start six-hourly ibuprofen; giving them at the same time is not usually recommended in young children. ■ **Do not** use paracetamol or ibuprofen to prevent febrile convulsions or for the sole purpose of reducing body temperature (i.e. if the child is not otherwise distressed) ■ **Do not** under-dress or over-wrap the child ■ **Do not** sponge the child (i.e. "tepid sponging") as there is limited evidence of efficacy at reducing fever and it **may cause the child distress** and discomfort, e.g. shivering	■ Keep up regular fluids (breast milk if breast feeding) ■ Look for signs of dehydration (seek advice if dehydration is suspected): sunken fontanelle, dry mouth, sunken eyes, absence of tears, decreased urine output (e.g. dry nappy), unwell appearance ■ Look for a non-blanching rash (i.e. rash does not disappear when the skin is pressed) ■ Check the child regularly (including overnight) ■ Avoid daycare or school while fever persists (and notify them of illness)	■ The child has a convulsion (often febrile in this setting) ■ The child develops a non-blanching rash ■ Fever persists for ≥ 5 days ■ Parent/carer feels that the child's condition is worsening rather than improving ■ Parent/carer is more worried than when they previously sought advice ■ Parent/carer is distressed or concerned that they are unable to look after the child

Adapted from:

National Institute for Health and Care Excellence (NICE). Fever in under 5s: assessment and initial management. 2019 (updated 2021). Available from: **www.nice.org.uk/guidance/ng143** (Accessed May, 2024).

National Institute for Health and Care Excellence (NICE). Suspected sepsis: recognition, diagnosis and early management. 2016 (updated 2024). Available from: **www.nice.org.uk/guidance/ng51** (Accessed May, 2024).

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