

# New traffic light system guides evaluation of febrile children

Kirsty Le Doare MRCPCH and Mike Sharland FRCPCH

Preschool children suffer frequent episodes of feverish illness leading to more primary-care consultations than for any other age group.<sup>1</sup> In the Avon Longitudinal Study of Parents and Children (ALSPAC) over two-thirds (68–74 per cent) of children under the age of five years had experienced symptoms of high fever in the previous 12 months; one-third of children (20–39 per cent) consulted their GP at least once for high temperature, with the highest proportion presenting between the ages of 6 and 18 months.<sup>2</sup>

Fever presents a conundrum for clinicians as the majority of febrile illnesses represent self-limiting viral infections. However, serious bacterial infections are still estimated to contribute to 20 per cent of childhood deaths in the UK.<sup>3</sup> It is vital that these children are identified and treated early, while supportive management of children with minor bacterial or viral infections is instigated in the community. The NICE 2007 guidance (CG47) of the management of feverish illness in children incorporated a traffic light system for assessing symptoms but the accuracy of the original system was questioned because a substantial proportion of serious bacterial infections, especially urinary tract infections, were mistriaged as low risk.<sup>4,5</sup>

## What is new in the updated guidelines?

Recently, NICE published a revised guideline that provides an updated traffic light system for the initial assessment and management of young children with fever.<sup>6</sup> The NICE traffic light system was designed for young children under five years of age and was intended for a range of settings (general practice, paediatric specialists, or remote assistance by health professionals), and is a colour-coded checklist of symptoms and signs. Children whose clinical features fall within the green zone are considered to be at low risk of serious illness, while those in the amber and red zones are at intermediate and high risk.

Though this new system has a relatively good negative predictive value, the system is less robust at identifying those children with serious bacterial infections (pneumonia, urinary tract infection, bacteraemia). The NICE guidance recommends that further investigations be directed according to the level of risk to prevent underdiagnosis. Two key areas have been added to the initial risk assessment in an attempt to improve this area, namely tachycardia (immediately triage to amber) and positive urinalysis. Despite this, the likelihood of diagnosing severe bacterial infection using the traffic light system is highest if the child looks unwell and has a fever above 39°C or lasting longer than 72 hours. As the majority of children will be triaged as intermediate risk (amber) the burden of onward referral is likely to continue to rise.

The success of national immunisation programmes and the availability of effective antimicrobial therapies have led to sig-

nificant declines in the burden of childhood infectious diseases in industrialised countries.<sup>7</sup> In the past two decades the introduction of vaccinations against *Haemophilus influenzae* serotype b (Hib), *Neisseria meningitidis* capsular group C and *Streptococcus pneumoniae* combined with an overall decline in capsular group B meningococcal disease has led to a major reduction of serious bacterial infections caused by these pathogens.<sup>8</sup> However, the estimates of severe bacterial infections that inform the NICE 2013 guidelines are based on research that is over 30 years old, making the health economic analysis difficult to interpret in today's paediatric population.

## Overcoming barriers

A welcome area of the new NICE 2013 guidance is the section on parental education in the management of fever. It encourages a rational stepwise approach to antipyretic therapy and advocates a move away from a reliance on fever reduction as an indicator of nonsevere illness. The recommendation is to use antipyretics to relieve the child's distress rather than to reduce fever alone.

## Conclusions

While the NICE 2013 guidance is a definite step in the right direction for the identification of serious bacterial infections in the under-fives, it is clear that there is still much to be done. First and foremost, the new traffic light system requires validation. Research is also needed to identify which children are at low risk of serious bacterial infections and can be safely managed in the home.

## References

1. McCormick AFD, et al. *Morbidity statistics from general practice. Fourth national study 1991–1992*. London: HMSO, 1995.
2. Hay AD, et al. *Fam Pract* 2005;22:367–74.
3. Ladhani S, et al. *Pediatr Infect Dis J* 2010;29:310–3.
4. Craig JC, et al. *BMJ* 2010;340:c1594.
5. De S, et al. *BMJ* 2013;346:f866.
6. NICE. *Feverish illness in children: Assessment and initial management in children younger than 5 years*. CG160. May 2013.
7. Sanders JW, et al. *Sci Prog* 2008;91(Pt 1):1–37.
8. Arkwright PD, et al. *Epidemiol Infect* 2005;133(6):979–84.

## Declaration of interests

None to declare.

*Dr Le Doare is a national subspecialty registrar in paediatric infection and immunology and Mike Sharland is professor of paediatric infection and immunology and consultant in paediatric infectious diseases and immunology at St George's Hospital, London*