



Jane Smith

# A is for aphorisms

Feed a fever, starve a cold? Or could it be starve a fever, feed a cold?

## Keywords

fever; common cold; therapeutics; aphorisms

The recommendations for management of fever have changed throughout the course of history, as has the very concept of fever. It has changed from something viewed as a diagnosis in its own right to a sign of something to be measured and as a trigger for a diagnostic trail to be made.

It is not possible to talk about feeding or starving of fevers and colds without firstly defining what they are and what they do.

## What is a fever?

The normal body temperature is not as clearly defined as we might think. The mean oral temperature of adults is 36.8°C plus or minus 0.4°C, but it also fluctuates in a circadian pattern as shown in *Table 1*.

The normal temperature also differs with place of measurement (*Table 2*); rectal measurement is the most accurate, but the least popular. Tympanic and/or axillary in children are generally approved methods of measurement.

Fever is a very common reason for parents to present their children to general practitioners (GPs) and emergency departments, as many believe that a fever is harmful and fear perceived consequences such as fits and serious infections.<sup>1–3</sup>

## What is a cold?

Symptoms of a cold include runny nose, sneezing, sore throat, cough and headache. Symptoms climax on days 2–3 and last, on average, 7–10 days, but some symptoms may persist beyond 3 weeks. Many

different viruses cause a cold, the most common are rhinovirus (30–50%) and corona virus (10–15%), while influenza is the third most likely (5–15%). Symptoms of cough and fever are the most predictive for influenza, but imprecise. The most common way of catching a cold is to touch secretions and auto-inoculate the virus, which is shed mostly on the second day of the illness and for up to 3 weeks after.<sup>4,5</sup>

Most upper respiratory tract infections (URTIs) in primary care are caused by 'cold viruses', and these often induce fever and anorexia.<sup>6–8</sup> The febrile response to colds is greater in children than adults.<sup>9</sup>

## Is fever beneficial or harmful?

Febrile convulsions occur in 2–4% of children under 5 years of age, but they are usually not associated with neurological or other problems.<sup>2</sup> In fact, it is well established that a fever is not as predictive of serious illness as the overall clinical condition,<sup>1</sup> which is probably why most GPs use other parameters to guide their judgement on the severity of an illness.

Fever generally enhances the activity of the immune system. The majority of evidence suggests that fever associated with infection is beneficial to survival.<sup>10</sup>

## The impact of feeding and starving on fever and immune response

Hippocrates used starvation to treat fever, a method which persisted until the early nineteenth century when Dr Robert Graves revolutionised common practice from 'starve a fever' to 'feed a fever'.<sup>11,12</sup>

This was probably in recognition of the hugely increased metabolic demands of fever, namely a 10% increase in metabolic rate for every 1°C increase in temperature.<sup>10</sup> Clearly there is a need for food to sustain energy and retain body mass.

Starvation (long-term caloric restriction) lowers core body temperature and gut induced vagal stimulation, which promotes immunity towards bacteria but not viruses. Fasting and dehydration increase the immunity against bacterial infections (extracellular antibody mediated) and reduce the antiviral immune response (intracellular). Thus, the anorexic response to URTIs is not a helpful one, as invariably in the community setting most URTIs and most fevers are of a viral aetiology.<sup>6,7,13</sup>

In summary, feeding changes immune responses by promoting interferon production (augmenting intracellular immunity), which mostly fights viral infections, the most common cause of fever in the primary care setting. However starvation biases the immune response towards bacterial infections, a far less likely cause of infection.

### The impact of feeding and starving on a cold

Despite searching widely on feeding and starving colds, evidence is sparse. A Cochrane review cautions on potential harm from excess fluids.<sup>14</sup> Another randomised study found no effect from feeding a milk-rich diet to people with colds on severity of illness or other features such as mucus and cough.<sup>15</sup> A recent extensive review of cold treatments stated that evidence about preventing and treating the common cold is frequently of poor quality, and results are inconsistent.<sup>9</sup> No study came closer to these on aspects of feeding or starving colds.

### Feeding fever with medications: Is treating fever beneficial?

If fever enhances survival then it should be no surprise to discover that treatments that cool are not associated with improved survival, and may even increase mortality in some settings.<sup>16</sup>

Common justifications for treating fever are to prevent seizures and provide comfort. However feeding febrile children antipyretics (paracetamol, aspirin or ibuprofen) does not prevent seizures. More so, antipyretic use has been shown to increase the spread of infection and prolong influenza, chicken pox and common colds.<sup>2,17,18</sup>

Uncomplicated fever may be best left untreated, but analgesia will relieve aches and pains, which may create more benefit.

### Conclusion

It would seem that feeding (while avoiding excess use of fluids) is the best option, most of the time, for improved outcomes. Feeding patients analgesic antipyretics routinely is not supported by evidence, nor is the use of starvation in the management of fevers or colds. Common sense and clinical judgement should continue to guide management.

### Author

Jane Smith MBBS, FRACGP, Grad DipFM, MHS, FAICD, Associate Professor of General Practice, Bond University Medical Program, Centre for Research in Evidence-Based Practice (CREBP), Gold Coast, QLD. [jsmith@bond.edu.au](mailto:jsmith@bond.edu.au)

Competing interests: Jane Smith is paid as a board member of the Therapeutic Goods Administration's Advisory Committee on the Safety of Medicines, Australian Medicines Handbook.

Provenance and peer review: Commissioned, externally peer reviewed.

### References

- Ogoina D. Fever, fever patterns and diseases called 'fever'—a review. *Journal Infect Public Health* 2011;4:108–24.
- Cannon JG. Perspective on fever: the basic science and conventional medicine. *Complement Ther Med* 2013;21:S54–60.
- Sund-Levander M, Forsberg C, Wahren LK. Normal oral, rectal, tympanic and axillary body temperature in adult men and women: a systematic literature review. *Scand J Caring Sci* 2002;16:122–28.
- Heikkinen T, Jarvinen A. The common cold. *Lancet* 2003;361:51–59.
- Eccles R. Understanding the symptoms of the common cold and influenza. *Lancet Infect Dis* 2005;5:718–25.
- van den Brink GR, van den Boogaardt DE, van Deventer SJ, Peppelenbosch MP. Feed a cold, starve a fever? *Clin Diagn Lab Immunol* 2002;9:182–83.
- Bazar KA, Yun AJ, Lee PY. "Starve a fever and feed a cold": feeding and anorexia may be adaptive behavioral modulators of autonomic and T helper balance. *Med Hypotheses* 2005;64:1080–84.
- Thompson M, Vodicka TA, Blair PS, Buckley DI, Heneghan C, Hay AD. Duration of symptoms of respiratory tract infections in children: systematic review. *BMJ* 2013;347:f7027.
- Allan GM, Arroll B. Prevention and treatment of the common cold: making sense of the evidence. *CMAJ* 2014;186:190–99.
- Kluger MJ. Is fever beneficial? *Yale J Biol Med* 1986;59:89–95.
- Bynum B. Discarded diagnoses, Fever. *Lancet* 2002;359:898.
- Bristowe JS. Remarks on the Treatment of Enteric Fever. *Br Med J* 1880;2:839–41.
- Simasek M, Blandino DA. Treatment of the common cold. *Am Fam Physician* 2007;75:515–20.
- Guppy MP, Mickan SM, Del Mar CB, Thorning S, Rack A. Advising patients to increase fluid intake for treating acute respiratory infections. *Cochrane Database Syst Rev* 2011:CD004419.
- Pinnock CB, Graham NM, Mylvaganam A, Douglas RM. Relationship between milk intake and mucus production in adult volunteers challenged with rhinovirus-2. *Am Rev Respir Dis* 1990;141:352–56.
- Hammond NE, Boyle M. Pharmacological versus non-pharmacological antipyretic treatments in febrile critically ill adult patients: a systematic review and meta-analysis. *Aust Crit Care* 2011;24:4–17.
- Aronoff DM, Neilson EG. Antipyretics: mechanisms of action and clinical use in fever suppression. *Am J Med* 2001;111:304–15.
- Earn DJ, Andrews PW, Bolker BM. Population-level effects of suppressing fever. *Proc Biol Sci* 2014;281:20132570.

**Table 1. Circadian temperature fluctuation in adults**

**Normal adult oral temperature range in degrees centigrade<sup>1</sup>**

Average	Maximum morning (6 am)	Maximum afternoon (4 pm)
36.8 (±0.4)	37.2	37.7

**Table 2. Temperature values in adults and children defined as normal and fever<sup>1</sup>**

Site of measurement	Normal low	Normal high	Single measure fever	Multiple measures fever
Axilla	35.5	37.0	>37.5	–
Oral	35.6	37.7	>37.8	>37.2
Rectal	34.4	37.8	>38.0	>37.5
Tympanic	35.4	37.8	>38.0	–
Any	–	–	–	>1.1 over baseline

correspondence [afp@racgp.org.au](mailto:afp@racgp.org.au)