

## Monitoring fever during the COVID-19 epidemic

By Paul Bergner

Fever is present in almost all cases of COVID-19 cases. Thus it is important to monitor body temperature during the pandemic. The other most common symptoms are dry cough and fatigue. An individual may NOT have a fever in the early stages, may be infectious, and may go on to develop serious disease. So lack of fever when other signs are present does not indicate lack of infection. The appearance of fever, however, with the other symptoms creates suspicion of COVID-19 infection at this time in the pandemic, and precautions need to be taken to prevent spread, and also to monitor the patient for the appearance of signs of serious illness.

---The most common fever presentation with COVID is "low-grade." What this means for you depends on your normal body temperature. See below.

---The fever in COVID-19 is typically intermittent. It may come and go, be completely gone one day and then reappear a day or two later.

---A higher fever (our local health department says over 100.5 F/38 C) can indicate a more serious expression of the infection. Our local department recommends a visit to the hospital.

---Any significant difficulty breathing requires a trip to the hospital.

---It is difficult to monitor for low grade fever because of variability in normal temperatures, lower baseline temperature in elders, and the margins of errors with common digital thermometers.

### Some basic science

The "normal" human body temperature is not 98.6F/37C. It never was. I have included references below because this myth is so firmly entrenched even in health care professionals. The individual who came up with this at the very least had unreliable equipment, and there is speculation he also simply manufactured data. The *Journal of the American Medical Association* ran an article debunking this myth in 1992, but most doctors and nurses and the general public never got the memo. See Mackowiak et al below. Researchers ten years later, in 2002, did a review of all published surveys of normal body temperature that appeared between 1935 and 1999. See Sund-Levander et al below.

---The average normal body temperature is 97.7F/36.5C Range = 91.8/33.2 to 100.8/38.2

---Temperature fluctuates in a rhythm during the day, about 0.9F/0.5C from a low on arising and a high at 4PM-6PM.

---Average normal temperature for elders is 96.8F/36C, with a diurnal rise from morning to evening of 0.5F/0.25C. A temperature of 98 or above could indicate fever in an elder.

---Physical exercise elevates body temperature, for instance a distance runner might develop a temperature of 104F/40C, and this is normal range. The elevation in temperature, which enhances immunity, is one of the benefits of exercise.

---A hot bath/hot tub can raise the body temperature several degrees, again, one of the benefits of the practice.

### Monitoring

The first step is to be familiar with the individual's normal baseline temperature. This should be calculated on arising, and then again about 4-6PM.

--- Oral digital thermometers are inaccurate on the first several readings, and typically read about a degree too low unless repeated 1 or more times. Thus they will almost always miss a low grade fever on the first reading. Good technique is to repeat the measure twice after the initial reading and see if it rises. Or keep repeating until you get the same reading twice in a row.

---Digital ear thermometers will give a different reading than oral temperature, possibly from 0.4/.22 to 0.8/.45 degrees high. These may also require several readings, and readings in both ears, to establish a repeatable reading.

---And an individual self monitoring might use both oral and ear digital measurement, and see how they correlate to establish the baselines on their equipment.

---Oral temperatures can be skewed high if one has eaten recently, or low if having a cold drink. Ear temperatures can be skewed by lying on one side, by going out in cold air, or by wearing audio earbuds.

### **Interpretation**

When measuring then we must consider

- Normal baseline temperature range for that individual (especially in those over middle age).
- Time of day, and normal daily temperature fluctuation for that individual
- Physical activity that might elevate temperature.
- A rise of 0.5F/0.25C above normal for the resting individual at that time of day might be considered a low grade fever.

### **Don't suppress the fever**

It has been a tenet of natural medicine for thousands of years now that fever is a beneficial healing response, that it should not be considered a disease in itself, and that it should not be suppressed. More recently authors of a paper for the American Academy of Pediatrics have stated this exactly in a position paper. See Sullivan et al below.

- Fever is a beneficial response.
- There is no benefit to medicating it.
- There is no level of fever (such as higher than 104F/40C) that poses a risk to the patient.
- The fever itself should be investigated for cause, but of itself poses no risk.
- Medications which lower fever may worsen the course of a viral infection. Recently the world Health Organization has cautioned against the use of ibuprofen and other non-steroidal antiinflammatory drugs in COVID-19 infections. See out notes and full set of references in "Aspirin and NSAID may Worsen Viral Infection" at <http://naimh.com/coronavirus>

1. Mackowiak PA, Wasserman SS, Levine MM. A critical appraisal of 98.6 degrees F, the upper limit of the normal body temperature, and other legacies of Carl Reinhold August Wunderlich. JAMA 1992;268:1578-1580.
2. 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 Jun;16(2):122-8. Review.

3. Sullivan JE, Farrar HC. Fever and antipyretic use in children. Section on Clinical Pharmacology and Therapeutics; Committee on Drugs Pediatrics. 2011 Mar;127(3):580-7.