

**Virtual Summer Academy 2020**

# **Presentation on Temperature Assessment**

Interview of

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**Nursing Innovation Created the  
Exergen TemporalScanner Thermometer!**

# Back to school recommendations from authorities direct temperature screenings to be done at home.

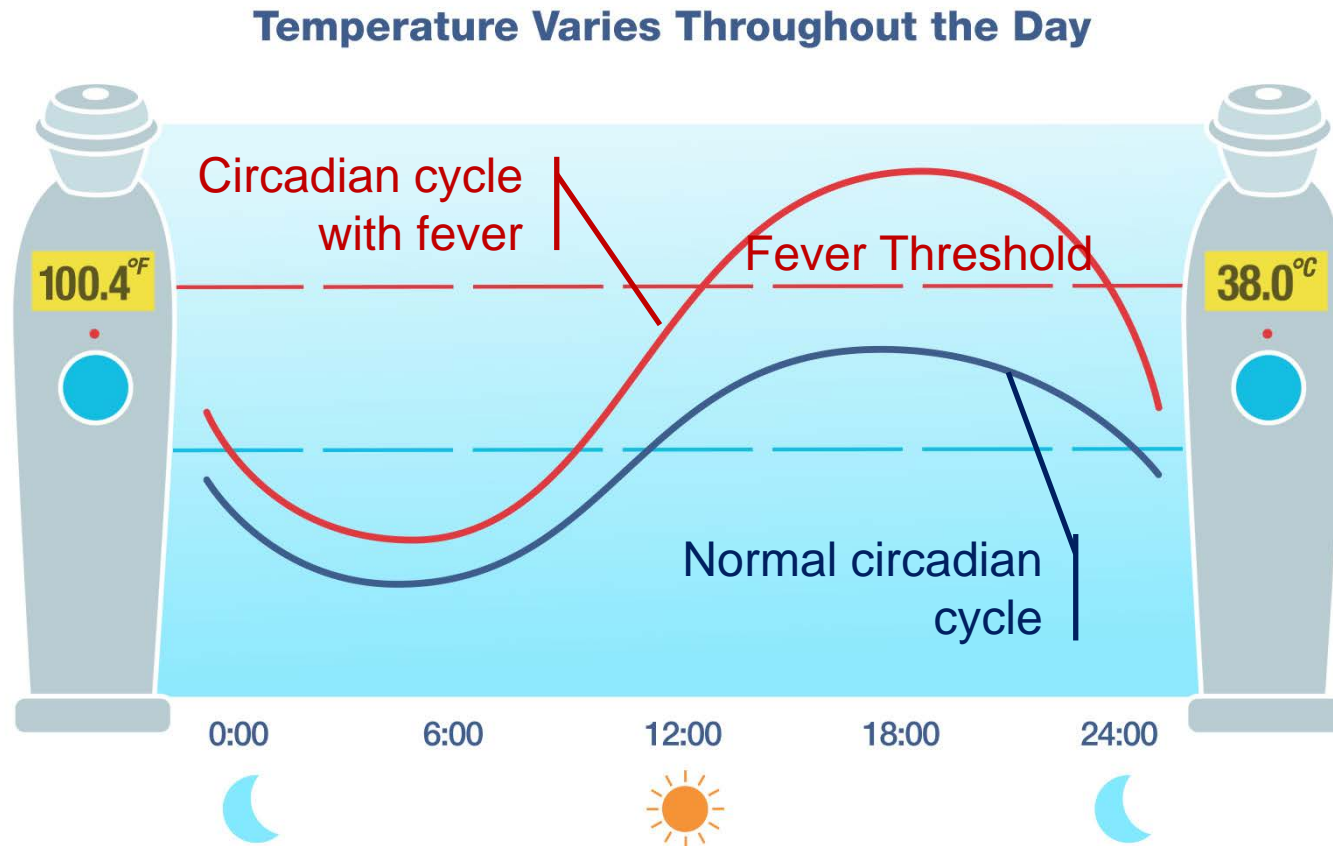
- [American Academy of Pediatrics \(AAP\) School Guidelines](#)
  - Frequently remind students, teachers, and staff to stay home if they have a fever of 100.4 degrees or higher or have any signs of illness.
- [Centers for Disease Control and Prevention \(CDC\)](#)
  - CDC does not currently recommend universal symptom screenings (screening all students grades K-12) be conducted by schools.
  - Parents or caregivers should be strongly encouraged to monitor their children for signs of infectious illness every day.
  - Students who are sick should not attend school in-person.
- [Massachusetts Department of Elementary and Secondary Education](#)
  - it is not recommended to temperature check students at entry due to the significant number of both false positive and false negative results.
  - Staying home if sick: As part of the social compact of re-opening, students and staff must stay home if they are feeling sick or have any symptom associated with COVID-19.

Q1: How do circadian rhythms impact temperatures and assessments of temperatures?

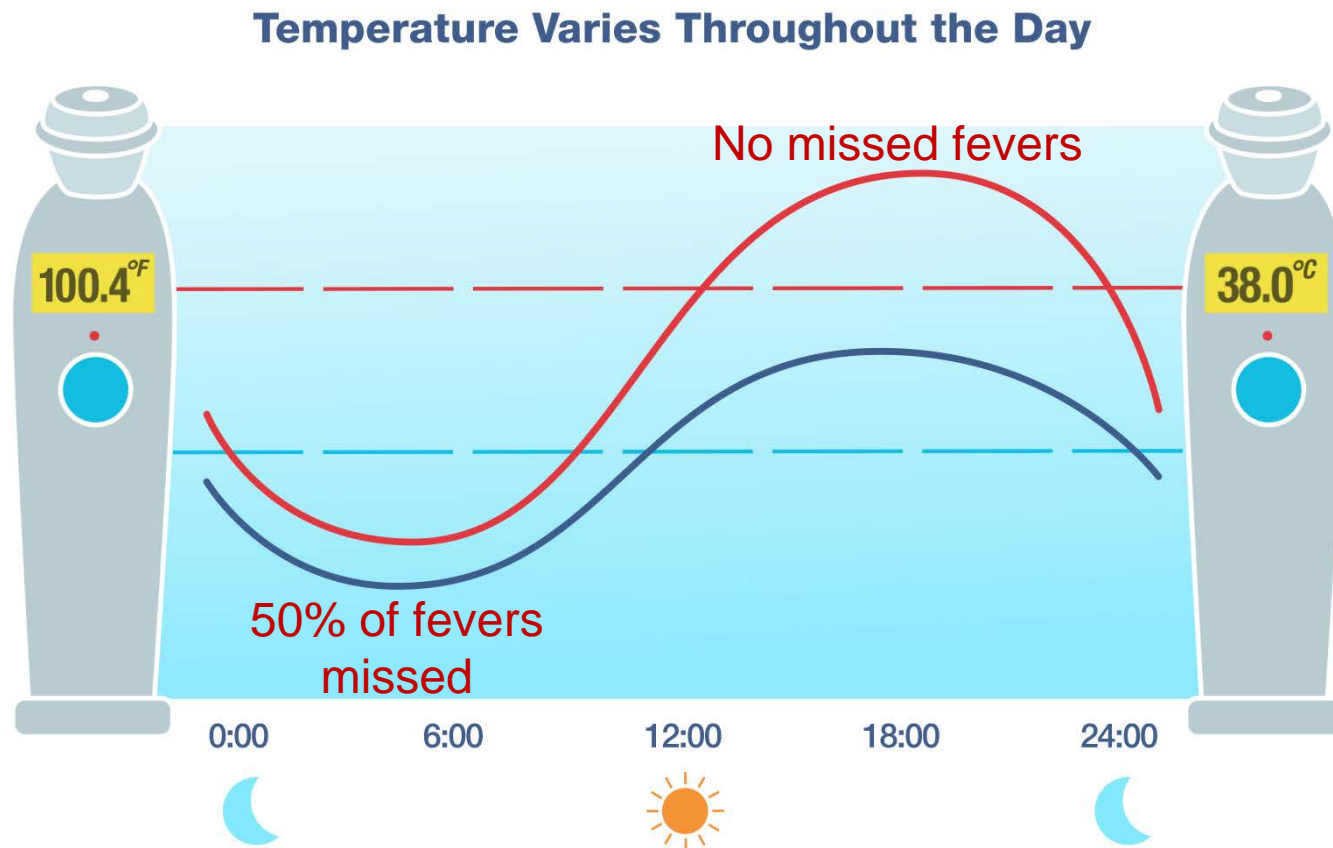
A1: Our internal biological clocks produce circadian cycles that vary throughout the 24 hours of each day. This causes body temperature to vary about 1.6°F (0.9°C) between lowest temperatures in the morning and highest temperatures in the evening. With fever, the circadian variation still occurs, but at higher temperatures.

Accordingly, temperature assessments in the morning are low and will miss about half of the fevers. Temperature assessments in the evening are high and will detect all the fevers.

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The New York Times | <https://nyti.ms/3gxMDno>

## *Anti-Inflammatory Drugs May Help Keep Virus in Check; Mornings Not Ideal for Fever Screening*

By Reuters

May 27, 2020

Morning fever screenings may be misleading

As businesses and cities reopen, screening people for fever when they arrive in the morning at work or school is likely to be widely used to help prevent coronavirus spread. But "morning may be the worst time" to screen for fevers, researchers say. They draw this conclusion from data collected from more than 300,000 people during studies of flu outbreaks in earlier years. "Fever-range temperatures ...were rarest during mornings, and were about half as common during mornings as during evenings in periods of high influenza activity," they report in a paper published on Tuesday without peer review on the medRxiv preprint server. "The results suggest that morning temperature measurements could miss many febrile disease cases," they said. (<https://bit.ly/2zEAJHo>)

# Q1: How do circadian rhythms impact temperatures and assessments of temperatures?

## Recent published studies:

Harding et al (2020). Fevers Are Rarest in the Morning: Could We Be Missing Infectious Disease Cases by Screening for Fever Then? Undergoing peer review at <https://doi.org/10.1101/2020.05.23.20093484>

Harding et al (2020). Fever incidence Is Much Lower in the Morning than the Evening: Boston and US National Triage Data. *West J Emerg Med*. 2020 Jun 24;21(4):909-917. doi: 10.5811/westjem.2020.3.45215

Harding et al (2019). The daily, weekly, and seasonal cycles of body temperature analyzed at large scale. *Chronobiol Int*. 2019 Dec;36(12):1646-1657. doi: 10.1080/07420528.2019.1663863. Epub 2019 Sep 17.

Q2: When do you recommend that temperatures be taken for school-aged youth?

A2: Twice Daily. Before leaving for school in the morning, and at dinner time in the evening. If a fever is detected at either time, the student stays home and parents should contact their medical care professional immediately.





## Q2: When do you recommend that temperatures be taken for school-aged youth?

Even if the student is learning on-line, it is important to check temperature twice daily for the sake of the health of students and family members.



Q3: What makes thermometers accurate? What should we know about thermometer accuracy?

A3: Published peer-reviewed clinical studies. Without such studies by medical professionals, there is no assurance of accuracy on children and adults in all settings.

How about No Touch Thermometers?

## Q3: What makes thermometers accurate? What should we know about thermometer accuracy?

No Touch thermometers are inaccurate, here is why:

Physiological Variable	Est. Range	Estimated standard deviation of temperature uncertainty	
		Remote IR	TA thermometry
Skin emissivity	$0.97 \pm 0.02$	0.31°C	0.03°C
Skin ambient temperature	$\pm 5^\circ\text{C}$	0.58°C	0.06°C
Variable perfusion on face	$\pm 1^\circ\text{C}$	0.58°C	0.06°C
Perspiration on the face	$\pm 1^\circ\text{C}$	0.58°C	0.06°C
95% confidence interval of errors due to identifiable skin physiological variables		2.09°C	0.21°C

Mass Dept of Ed. states “it is not recommended to temperature check students at entry due to the significant number of both false positive and false negative results.” Temperature should be checked at home.

Q4: What types of thermometers are recommended for use in schools? For use by families?

A4: Only those that are clinically accurate as demonstrated by published peer-reviewed clinical studies.

For school nurses checking students that might be sick, a professional grade fast, accurate, non-invasive thermometer scanning the temporal artery with more than 80 published peer-reviewed clinical studies, is best.



Q4: What types of thermometers are recommended for use in schools? For use by families?

A4: Only those that are clinically accurate, as demonstrated by published peer-reviewed clinical studies.

For families, a home model thermometer that is fast, accurate, and non-invasive, scanning the temporal artery, backed by more than 80 published peer-reviewed clinical studies, is best.



Q5: How is the cut-off for fever chosen?

A5: 100.4°F (38.0°C) is the medically accepted definition of a fever for more than 100 years, is recommended by AAP, CDC and WHO, and used in every medical institution in the world.

Q6: Can you explain how a thermometer margin of error might guide the choice for a cut-off of fever?

A6: Some attempts to use a lower cut-off for Covid-19 screening have been made due to the low readings of the no touch thermometers from their inaccuracies. These attempts have been unsuccessful in “improving” the no touch devices’ accuracies.

A thermometer with accuracy backed by more than 80 published peer reviewed studies requires no adjustment to the medical standard cut-off for fevers.

## For further information:

Information on thermometers scanning the temporal artery:

[www.exergen.com](http://www.exergen.com)

Information on more than 80 published peer-reviewed clinical studies: [www.exergen.com/s](http://www.exergen.com/s)