

# PICO Worksheet and Search Strategy

Define your question using **PICO**: Population, Intervention, Comparison, and Outcome.

Population: Children who come to Emergency Department

Intervention: Temperature Assessment

Comparison: No comparison group. Question is about an issue of interest.

Outcome: Accurate Assessment

Write out your question: What method for assessing temperature in children who come to the Emergency Department is most useful for an accurate assessment?

List the main topics and terms from your question that you can use to search.

Temperature Measurement or Body Temperature Assessment  
Emergency Room or Emergency Department  
Children or Pediatrics

Check any limit that may pertain to your search:

☒ Age    ☐ Language    ☐ Year of publication \_\_\_\_\_

Type of study/publication you want to include in your search:

☒ Systematic Review or Meta-Analysis  
☒ Clinical Practice Guidelines  
☒ Critically Appraised Research Studies  
☐ Individual Research Studies  
☐ Electronic Textbooks

Check the databases you searched:

☒ Cochrane  
☐ Joanna Briggs  
☐ DARE  
☐ Clinical Evidence  
☒ AHRQ Evidence Reports  
☒ Guidelines Clearinghouse  
☐ ACP Journal Club  
☒ Evidence-Based Journals  
☒ CINAHL  
☐ PubMed Clinical Queries  
☐ UpToDate  
☐ MD Consult

What information did you find to help answer your question?

1) Cochrane: Found no systematic reviews found

2) AHRQ Evidence Reports

**Emergency Severity Index, Version 4: Implementation Handbook**

Chapter 6 – the Role of Vital Signs in ESI Triage

The ESI Triage Assessment Team recommends that vital signs of patients under age 3 be assessed at triage.

The generally accepted definition of fever is a rectal temperature greater than 38° C.

3) National Guidelines Clearinghouse:

**Evidence based clinical practice guideline for fever of uncertain source in infants 60 days of age or less.**

Cincinnati Children's Hospital Medical Center. Evidence based clinical practice guideline for fever of uncertain source in infants 60 days of age or less.

Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2003 Jun. 12 p. [49 references]

**Clinical Assessment:** It is recommended that rectal temperatures are preferred to axillary or other temperature measures (Center for Reviews and Dissemination Reviewers, 1996 [M]; Hooker, 1993 [C]; Reisinger, Kao, & Grant, 1979 [C]).

**Note 1:** A parental report of fever detected only by touch is likely to be accurate (sensitivity 82--89%, specificity 76--86%) (Graneto & Soglin, 1996 [C]; Hooker et al., 1996 [C]; Singhi & Sood, 1990 [C]).

**Note 2:** The magnitude of fever may not be useful for predicting illness source or severity (Bonadio et al., 1991 [C]; Kluger, 1992 [S]).

This summary was completed by ECRI on September 1, 1998. The information was verified by the guideline developer on December 1, 1998. This summary was updated by ECRI on March 11, 2004.

4) Evidence-Based Journals: Nothing found.

5) Cinahl:

El-Rahdi AS. Patel S. An evaluation of tympanic thermometry in a paediatric emergency department. *Emergency Medicine Journal*. 2006 Jan; 23(1): 40-1.

Our findings are consistent with other reports such as a review of 19 studies from 1989 to 1994 which concluded that tympanic measurements had moderate to strong correlation with oral, rectal and, core temperatures. Tympanic thermometry has many potential benefits, particularly for a busy paediatric emergency setting. The technique is quick, safe, does not require the removal of clothing, easy to use without the risk of cross infection, and is not influenced by environmental temperature.

The sensitivity of tympanic measurements to detect fever was significantly higher than that of axillary measurements. The reason why tympanic thermometer could not achieve a higher sensitivity at rectal temperatures of 38.0–38.9 °C may

be due to poor technique such as not targeting the eardrum, which emits the infrared energy, or to a small size of the external auditory canal in relation to the size of the scan probe. The latter reason may explain why some reports have shown lower accuracy of tympanic measurements in younger compared with older children.

Fever being missed in a high percentage of children due to measurement at the axilla could have serious consequences regarding investigations and treatment.

**Conclusion:**

Tympanic thermometry is a practical method of measuring temperature in children in the emergency setting. It is more accurate than the method of measurement with an electronic axillary thermometer, and it is recommended because of its potential benefits.

Lanham DM, Walker B, Klocke E, Jennings M. Accuracy of tympanic temperature readings in children under 6 years of age. *Pediatr Nurs*. 1999 Jan-Feb;25(1):39-42.

**CONCLUSIONS:** Sensitivity, specificity, positive predictive value, and negative predictive value are unacceptably low and the number of children with fever who would be missed by screening with a tympanic thermometer is unacceptable. Findings of this study do not support the use of tympanic thermometers to detect fever in children under 6 years of age.

**Reflection:**

This is a perfect example of what often happens when you search for evidence. There appears to be conflicting information here. So, you must determine to which evidence you will give the most weight. For example, the one guideline states that rectal temperatures are preferred to axillary and other temperature measurements. However, the guideline refers you to studies done 10+ years ago. Because there was no definitive answer to the question in the "appraised" resources, I searched CINAHL. Two articles were retrieved that specifically address this issue – one from 1999 and one from 2006. You will need to appraise the articles yourself for validity of the findings. However, keep in mind that there is a gap of 6-7 years between the research studies and the measurement devices have undoubtedly improved during that time period.