



Temperature Measurement for Critically ill Adults

ASSESSMENT & CLINICAL PRACTICE

1	Critically ill unstable patients (see table 1) require continuous invasive temperature (using brain, intra-vascular or urinary bladder) monitoring that is recorded at least hourly. Grade B
2	Complex patients (see table 1) require invasive temperature (using brain, intra-vascular or urinary bladder) measurement that is recorded at least second hourly. Grade B
3	For routine monitoring of stable patients (see table 1) measurement of temperature using either oral or axillary methods are required at least four-hourly. Grade C
4	Tympanic or temporal artery temperature measurement methods should not be used as these methods do not accurately reflect core body temperature. Grade B

INFECTION PREVENTION

5	Clinicians should undertake a risk assessment to identify the risk of contamination and mucosal or conjunctival splash injuries when taking a patients temperature; and PPE (including goggles/face shield/gloves and gown/apron) as per NSW 2007 infection prevention control policy should be worn accordingly. National and NSW Policy
6	The 5 moments of hand hygiene must be adhered to. Hand hygiene Policy
7	To reduce the risk of microbial transmission ICUs should consider having either a electronic thermometer at each bed area OR disposable single use thermometers. Consensus
8	To reduce the risk of microbial transmission where patients are considered stable but are isolated ICUs might consider the use of disposable single use thermometers. Consensus
9	Electronic thermometers must be cleaned between patients. This includes where equipment is shared between bed areas and when a patient is discharged. Consensus
10	Clinicians should refer to state or local IDUC management guidelines to minimise CAUTI. Consensus

GOVERNANCE

11	To facilitate rapid detection and treatment of abnormal temperatures ICUs should consider developing standard definitions and interventions for hyperthermia and hypothermia. Consensus
12	Fever control including administration of anti-pyretics should not be commenced without consultation with senior medical officers. Consensus
13	Staff should receive education on <ul style="list-style-type: none"> • correct use and calibration of equipment • Local definitions and standard treatments for abnormal temperatures. Consensus
14	Education related to temperature measurement should be included in patient assessment practices. Consensus
15	Evaluation of adherence to this guideline should be incorporated into the audit of clinical practices related to patient assessment. Consensus

> 41.5°C	• Extreme hyperpyrexia
> 40-41°C	• Hyperpyrexia
38.4-39.9°C	• Hyperthermia
37.5-38.3°C	• Fever
36.5-37.5°C	• Normal
34-35.9°C	• Mild hypothermia
32-33.9°C	• Moderate hypothermia
30.3-31.9°C	• Mod-deep hypothermia
<30°C	• Deep hypothermia

SUMMARY TABLE

Patient group	Measurement method	Frequency
Critically ill and unstable patients Patients with significant haemodynamic, respiratory, thermoregulatory or neurological instability	Continuous invasive temperature using brain, intra-vascular, or urinary bladder	Temperature recorded at least hourly
Complex patients Patients whose condition is stable but have potential for complication or deterioration	Continuous invasive temperature using brain, intra-vascular, or urinary bladder	Temperature recorded at least second-hourly
Routine monitoring of stable patients Patients who do not require intense or invasive physiological monitoring	Continuous urinary bladder (if IDUC insitu), oral or axillary	Temperature recorded at least fourth-hourly

Grading of Recommendations	
A	Body of evidence can be trusted to guide practice
B	Body of evidence can be trusted to guide practice in most situations
C	Body of evidence provides some support for recommendation/s but care should be taken in its application
D	Body of evidence is weak and recommendation must be applied with caution
CONSENSUS	Expert opinion where consensus was set as a median of ≥ 7 (Likert 1-9)

CLINICAL CONSIDERATIONS WHEN CHOOSING A METHOD

	Method	Clinical considerations	Potential problems
INVASIVE	Brain	Probe should be in non-injured tissue	<ul style="list-style-type: none"> • Highly invasive, reading may be influenced by injury/ ischaemia
	Direct blood PA; PiCCO	Requires aseptic insertion and should be removed when there is no longer an indication	<ul style="list-style-type: none"> • Blood stream infection
	Urinary catheter	Requires aseptic insertion and should be removed when there is no longer an indication for urine measurement	<ul style="list-style-type: none"> • May be effected by urine output (the effects of oliguria on accuracy are unknown)
	Oesophageal	Probe needs to be located within distal third of oesophagus (confirmed by CXray to be within cardiac shadow)	<ul style="list-style-type: none"> • Can take significant time to insert • Training to ensure accurate placement (38, 39)
	Rectal	Tip should be 4cm inside rectum (23)	<ul style="list-style-type: none"> • Presence of hard faeces impairing placement, inflammation around rectum & heat producing
	Oral	Must be placed in posterior sublingual pocket (perfused by branch of external carotid)	<ul style="list-style-type: none"> • Oral or mouth breathing, administration of oxygen or warmed gases via an ETT do not effect accuracy
NON-INVASIVE	Axillary	Placement in central position with arm adducted to the chest wall(16)	<ul style="list-style-type: none"> • May be significantly affected by ambient temperature, local blood flow, sweat, inappropriate placement of probe, correct timing