

Society of Critical Care Medicine (SCCM) and the Infectious Diseases Society of America (IDSA) Guidelines for Evaluating New Fever in Adult Patients in the ICU - 2023

The primary focus of this guideline is directed at fever of infection etiology.

Fever etiology

- Include both infectious and noninfectious causes.
- Because early treatment initiation may improve outcomes of infections, initial evaluation of patients with new-onset fever is usually directed at potential microbial causes.
- Noninfectious causes of new fever in ICU Patients.
 - Venous thrombosis
 - Acalculous Cholecystitis
 - Drug fever including Jarisch-Herxheimer reaction (sudden and transient fever that may occur within 24h after Abx administration)
 - Blood product transfusion, cytokine release syndrome and Immune reconstitution inflammatory syndrome
 - Acute myocardial infarction and Dressler syndrome (pericardial injury syndrome)
 - Adrenal insufficiency
 - Fat emboli
 - Fibroproliferative phase of ARDS, pulmonary infarction, pneumonitis without infection
 - Gout
 - Ischemic stroke and ICH
 - Malignant hyperthermia, neuroleptic malignant syndrome and serotonin syndrome
 - Nonconvulsive status epilepticus
 - Withdrawal from certain substances including alcohol, opiates, barbiturates, benzodiazepines
 - Pancreatitis
 - Thyroid storm
 - Tumor lysis syndrome

Fever definition:

- Fever in ICU patients is defined as the presence of a single temperature measurement greater than or equal to 38.3°C (100.9°F).
- Not all patients with infection manifest fever and, in fact, the absence of fever in patients with infection is associated with worse outcomes. Consequently, the recommendations in this guideline may apply to ICU patients with suspected infection regardless of the presence of temperature elevation.

Temperature monitoring methods

Central temperature monitoring methods are preferred when thermistors are in place for:

- Pulmonary artery catheters
- Bladder catheters
- Esophageal balloon

For patients without these devices in place use oral or rectal temperatures over other temperature measurement methods that are less reliable such as axillary or tympanic membrane.

Fever treatment

- Avoid routine use of antipyretic medications for the specific purpose of reducing the temperature except in neurocritically ill patients including post cardiac arrest.
 - Fever is often therapeutically reduced to decrease metabolic demand, especially in critically ill patients with limited physiologic reserves, however:
 - A systematic review and meta-analysis of 13 RCTs including 1,963 non-neurocritically ill patients were examined to inform these guidelines. Fever management reduced body temperature but did not improve 28-day mortality.
- For patients with fever who value comfort by reducing temperature use antipyretics over nonpharmacologic methods to reduce body temperature.

My personal approach is not to treat patients with fever of infectious etiology unless:

- Neurocritically ill including post cardiac arrest
- Hemodynamically unstable with hypotension with out of proportion tachycardia (fever produces vasodilation) or requiring high dose vasopressors
- Discomfort caused by fever

Workup for patients who develop fever during ICU stay

- Blood cultures.
 - Two sets of blood cultures one after the other, from different anatomical sites, without a time interval between them.
 - For patients with fever without an obvious source and who have a central venous catheter perform simultaneous collection of central venous catheter and peripherally drawn blood cultures to allow calculation of differential time to positivity
- Rapid molecular tests on blood to be used with concomitant blood cultures
- CXR
- Thoracic bedside ultrasound when sufficient expertise is available to identify pleural effusions and parenchymal or interstitial lung pathology more reliably in patients with abnormal CXR.
 - Insufficient evidence to recommend the use of thoracic bedside ultrasound for patients with fever without CXR abnormalities.
- CT for patients who have recently undergone thoracic, abdominal, or pelvic surgery (in collaboration with the surgical service) if an etiology is not readily identified by initial workup.
- Abdomen ultrasound for patients with either abdominal symptoms, abnormal physical examination or increased liver enzymes. In my view this is particularly useful for diagnosing calculus and acalculous cholecystitis.
- For patients with pyuria and in whom urinary tract infection is suspected replace the urinary catheter and obtain urine cultures from the newly placed catheter.
- For patients with suspected pneumonia, or new upper respiratory infection symptoms, recommend testing for viral test panels in addition to traditional methods.
- For patients in whom other diagnostic tests have failed to establish an etiology perform PET-CT scan if the risk of transport is deemed acceptable.
 - Insufficient evidence to recommend the use of WBC scan for patients with fever without an established etiology.

- PCT and PCR
 - In summary, measuring PCT or CRP in critically ill patients with a new fever and no clear focus of infection with low to intermediate clinical probability of bacterial infection is recommended in addition to bedside clinical evaluation, but not in patients with high clinical probability of bacterial infection.

Caveats regarding PCT and PCR

- To date, major guidelines recommend against routine use of biomarkers in the setting of sepsis and septic shock, out of respect for uncertain benefit and cost and availability issues.
 - However, in the setting of fever and lower likelihood of infection, there may be a role, when used in conjunction with clinical assessment, in obtaining a baseline value to assist in the discontinuation of antimicrobial therapy and thus reduce unnecessary antimicrobial exposure.
- More recent retrospective studies have shown that PCT may be elevated during severe viral illness including influenza and COVID-19, potentially making the discriminating power for predicting the causative microorganisms less useful.
- Serum levels of PCT are associated with the severity of the infection and decrease rapidly after antibiotic treatment.
- In deciding whether to use CRP or PCT the diagnostic accuracy and specificity of PCT are higher than those of CRP.
- In ICU patients with suspected sepsis, clinicians should not initially withhold antibiotics, but PCT levels of less than 0.5 µg/L or levels that decrease by greater than or equal to 80% from peak levels may guide antibiotic discontinuation once patients stabilize.
- More recent studies
 - A meta-analysis of 11 RCTs involving 4,482 patients reported that PCT-guided antibiotic treatment in ICU patients with infection and sepsis patients resulted in improved survival and lower antibiotic treatment duration.
 - The latest and largest systematic review and meta-analysis to date of 16 studies and greater than 5000 patients showed that PCT-guided antibiotic discontinuation appeared to decrease antibiotic utilization by 1 day and improve mortality.