Fever in the Postoperative Patient

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KEYWORDS

• Fever • Inflammation • Atelectasis • Urinary tract infection • Pneumonia
• Necrotizing soft-tissue infection • Intra-abdominal abscess • *Clostridium difficile*

KEY POINTS

- Postprocedure fevers vary in the timing of their occurrence, duration, and severity.
- Such fevers do not all have an infectious cause, but they all require thorough investigation to rule out life-threatening conditions.
- This article summarizes the principles of diagnosis and management of postprocedure fevers for the emergency care provider.

INTRODUCTION

The emergence of fever, defined as a temperature greater than 38°C (100.4°F), during the perioperative time course can present a diagnostic and management challenge for the emergency medical care provider.[1] Infectious and noninfectious causes of the fever must be distinguished. Infectious causes should be considered mainly for fever presenting later than 48 hours after surgery, whereas early postoperative fever is most commonly attributed to noninfectious causes.[2] Others have stated that noninfectious causes appear to cause lower-temperature fevers (<38.9°C [102°F]), whereas a higher temperature should raise concern for an infectious cause.[3] Despite these claims, the cause of postprocedure fever is often not identified despite the rigorous efforts of clinicians. The classic "Ws" of postoperative fever (**Table 1**), long taught to medical students as mantra, have been challenged recently.[4]

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Table 1
Classic "Ws" of postoperative fever

W	Cause	Timing
Wind	Atelectasis	POD 1–2
Water	Urinary tract infection	POD 2–3
Wound	Wound infection	POD 3–7
Walking	Deep vein thrombosis/thrombophlebitis	POD 5–7
Wonder drug	Drug fever	POD >7

Abbreviation: POD, postoperative day.
Data from Cline D, Stead LG. Abdominal emergencies. New York: McGraw Hill; 2007.

The causes of postprocedural fever range from inflammation or drug reaction to life-threatening necrotizing soft-tissue infection (NSTI). As with all medical diagnoses, a thorough history and physical examination should serve as the diagnostic starting point in ascertaining relevant information in terms of exposure to infectious pathogens. In addition, the timing of fever after a procedure can help differentiate potential causes. It is therefore useful to divide the time frame of postprocedure fever into 4 categories: immediate, acute, subacute, and delayed. Fevers that occur in the first 4 days after surgery are less likely to represent infectious complications than are fevers occurring on the fifth and subsequent days (**Fig. 1**). Fever can also accompany the continuum of systemic inflammatory response, sepsis, severe sepsis, and septic shock (**Table 2**).

The time of emergence of postprocedure fever can guide the provider's differential diagnosis and, thus, management decisions. In a prospective study of 81 patients with idiopathic postoperative fever, Garibaldi and colleagues[2] found that 80% of those with fever on the first postoperative day had no infection. Within the group in whom fever developed by the fifth postoperative day, 90% had an identifiable source such as wound infection (42%), urinary tract infection (UTI) (29%), or pneumonia (12%).[2,5] Dellinger[6,7] showed that early fevers (ie, emerging between days 1 and 4) rarely represent an infection. However, a fever that begins on or after postprocedure day 5 is much more likely to represent a clinically significant infection, so appropriate diagnostics to look for an infectious source may be useful. These tests can include laboratory investigations (blood culture, urine cultures, complete blood counts) and images (plain

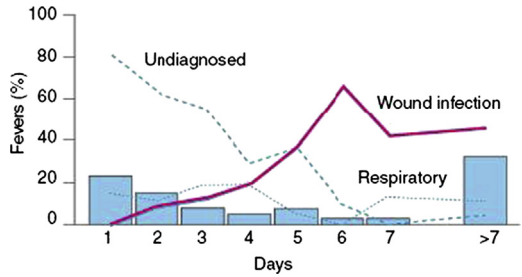

Fig. 1. Percentage of postoperative fevers occurring on the indicated day following an operative procedure. Lines indicate the percentage of fevers occurring on each day attributable to the cause indicated. (*From* Dellinger EP. Approach to the patient with postoperative fever. In: Gorbach S, Bartlett J, Blacklow N, editors. Infectious diseases. Philadelphia: Lippincott Williams & Wilkins; 2004. p. 817–23; with permission.)