

Source Identification and Source Control



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KEYWORDS

• Sepsis • Source identification • Source control • Intra-abdominal infection

KEY POINTS

- Rapid time to antibiotics is important, but they may not themselves provide adequate source control.
- A broad differential is essential in septic patients, because the source of infection may not immediately identifiable.
- Typical workup strategies in sepsis such as the chest radiograph and urinalysis can be inherently misleading.
- Intraabdominal sources of sepsis are difficult to diagnose, treat, and frequently require rapid surgical intervention.

INTRODUCTION

The medical concept of source control as a component of treatment for infection dates back as early as the 17th century BC. The Edwin Smith papyrus of ancient Egypt describes 48 medical cases, one of which details methods at the time to assist with the drainage of a chest wall abscess.^{1,2} In modern medicine, the concept of source control continues to be a cornerstone of sepsis management, albeit now far more complex than the astringents and poultices¹ used by the ancient Egyptians to assist with drainage.

Source control in sepsis first requires identification of an infectious source followed by the subsequent interventions used to control specific sites of infection and to modify factors that promote microbial growth or impair host defenses to infection.³ In the emergency department (ED), this process can be challenging especially because the source of the infection may not be readily apparent. Whereas a chest radiograph, urinalysis (UA), and blood cultures are ubiquitous in the evaluation of sepsis, sometimes further investigation is required as a surgical process (eg, appendicitis, cholecystitis) may be the underlying culprit pathology.

The authors have nothing to disclose.

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The Surviving Sepsis Campaign (2012)⁴ provides an update to current sepsis treatment guidelines, including multiple topics pertinent to source control and their level of evidence to support these recommendations. These include recommendations regarding obtaining cultures, starting antibiotic therapy, and performing surgical source control.

GENERAL WORKUP

History

Although obtaining a history is part and parcel of every patient encounter in the ED, unfortunately it may be limited, misleading, or downright unobtainable owing to the patient's illness. If the emergency physician is fortunate, the patient or family member may relate complaints such as fevers and chills that point more toward an infectious etiology. However, sepsis is the most complex disease entity emergency physicians will encounter because the patient complaints are often nonspecific and may simply be dyspnea or abdominal pain, which are associated with a great number of possible differential diagnoses. On the extreme end of the spectrum, a patient may be incapable of providing any history owing to an acute change in mental status or an underlying comorbid condition such as dementia.

Because of the challenges described in trying to arrive at a suspicion of sepsis, it is essential that the emergency physician try to gather as much information as possible from all available resources. Information can be garnered from emergency medical services personnel, a long-term care facility, family, friends, and perhaps most important, previous patient encounters. A careful review of the patient's medical record can be invaluable, because it may have previous culture results, recent prior surgeries, significant medications (eg, immunosuppressants), previous and recent antibiotics, or past medical history that changes the evaluation (eg, HIV). Taking the extra time to gather information becomes more important with older patients as they notoriously will have nonspecific presentations of sepsis and may be more likely to harbor surgical disease.

Physical Examination

Some patient complaints such as chest pain allow the emergency physician to direct their physical examination in pursuit of specific disease entities on the differential diagnosis. However, it is not uncommon that a patient may present with vague complaints and the physical examination must be appropriately thorough as no one organ system rises to the top as the potential origin of disease. Sepsis often falls into this category and the astute emergency physician should realize that the physical examination is of tremendous importance in guiding diagnostic inquiry.

The clinical manifestations of inflammation suggestive of infection may or not be apparent on physical examination. These include the *rubor* (redness), *calor* (warmth), *dolor* (pain), and *functio laesa* (loss of function).³ A thorough examination should be undertaken and any abnormalities noted. General observations such as alertness, distress, and pain are all useful. The examination should take note of any signs of hardware or prior and/or recent surgeries. These could include indwelling venous catheters, port sites, drains, urinary catheters, or any other medical devices. Also consider scars that could be suggestive of underlying hardware, including orthopedic devices.

Although the emergency physician is likely accustomed to considering pulmonary and urinary sources of sepsis, it is important to keep in mind that the skin (eg, cellulitis, abscess), genitourinary (eg, abscess), joints (eg, septic joint), and abdomen (ie,

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