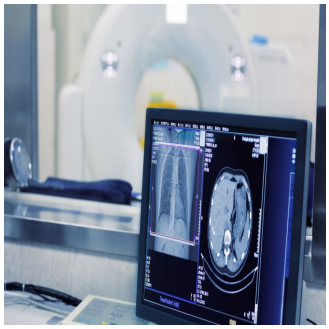
HealthManagement
Promoting Management and Leadership

Balancing Risk and Benefit: The Role of CT in Sepsis Management



Sepsis remains a leading cause of morbidity and mortality, requiring rapid and precise intervention to improve patient outcomes. Early detection and management are critical, as delayed treatment can significantly increase the risk of progression to septic shock and multiple organ failure. Computed tomography (CT) is widely used to identify infectious foci, providing clinicians with essential diagnostic information that informs treatment decisions. However, the use of CT scans presents certain risks, including exposure to ionising radiation and potential adverse effects from iodinated contrast media administration. A recent interdisciplinary survey published in *Insights into Imaging* explored physicians' perspectives on the benefits and risks of CT in septic patients, offering insights into the factors influencing clinical decision-making across different medical specialities.

The Justification for CT in Septic Patients

The survey revealed a strong consensus among physicians regarding the necessity of CT scans in sepsis management, with the majority agreeing that the benefits outweigh the associated risks. CT imaging enables the rapid identification of infection sources, such as pneumonia, intra-abdominal abscesses or other critical complications, which are essential for guiding appropriate treatment. Timely imaging is particularly important, given that delays in antimicrobial therapy and surgical intervention can lead to increased mortality rates in septic patients.

While alternative imaging techniques, such as ultrasonography and magnetic resonance imaging (MRI), are available, they present certain limitations. Ultrasonography is highly dependent on operator skill and may not always provide sufficient detail, particularly for deep-seated infections. MRI, though offering excellent soft tissue contrast and avoiding ionising radiation, is often less accessible in emergency settings and requires a longer scanning time, making it less suitable for critically ill patients. Given these considerations, most physicians surveyed supported the routine use of CT in septic patients, even acknowledging the associated radiation exposure.

Despite this general agreement, some variations in opinion were noted, particularly concerning when and how CT should be employed. While nearly all respondents agreed that CT is justified for detecting an infectious focus, some expressed reservations about performing repeat scans without a clear clinical indication. This cautious approach reflects an effort to balance the diagnostic benefits of CT with the need to minimise unnecessary radiation exposure.

Contrast Media: Indications and Contraindications

The administration of iodinated contrast media enhances the diagnostic accuracy of CT scans, particularly for detecting infections in the abdomen and thorax. However, physicians expressed differing views on the appropriate use of contrast-enhanced CT (CECT), highlighting concerns about potential adverse effects. The strongest indication for contrast administration was in whole-body and abdominal CT scans, where it improves the visualisation of infectious foci. However, opinions were divided regarding its necessity in chest imaging, with some preferring unenhanced scans in these cases.

Concerns regarding contrast media largely revolved around its potential to cause adverse reactions, particularly in patients with pre-existing renal impairment or thyroid disorders. Physicians showed varying levels of caution when assessing these risks. While some specialists viewed severe allergic reactions as an absolute contraindication, others advocated for appropriate premedication rather than completely avoiding contrast use. The survey also revealed differences in approach based on medical specialty, with radiologists tending to exercise the most caution regarding contrast use in patients with manifest hyperthyroidism.

Another key concern was contrast-induced nephropathy (CIN), a form of acute kidney injury that has been widely debated in medical literature. The survey results reflected this uncertainty, with some physicians considering renal impairment a relative contraindication, while others deemed

contrast administration acceptable with appropriate precautions, such as hydration. Interestingly, end-stage renal failure requiring dialysis was not widely viewed as a contraindication, suggesting that physicians perceive contrast risks differently depending on the severity of kidney dysfunction.

Clinical Decision-Making Beyond CT

In cases where an initial CT scan fails to identify an infectious source, physicians must decide on the next steps. The survey indicated that the most commonly preferred approach was to rely on further diagnostic tests rather than immediately repeating the scan. This approach aligns with efforts to reduce unnecessary radiation exposure and ensure that imaging is used judiciously in clinical practice.

However, the majority of respondents supported repeating CT scans in cases of clinical deterioration, recognising the need for ongoing assessment in unstable septic patients. In contrast, there was reluctance to perform follow-up scans if the patient's condition remained unchanged, with most physicians opposing routine repeat imaging after three days. Similarly, the survey found limited support for follow-up CT scans after one week in clinically improved patients. These responses suggest that physicians prioritise targeted imaging based on evolving clinical needs rather than adopting a blanket approach to repeat scanning.

The findings also highlighted differences in attitudes towards alternative imaging modalities. While some physicians favoured the use of ultrasonography, MRI or PET-CT in cases where an initial CT scan was inconclusive, others remained sceptical of their diagnostic value in this context. Radiologists, in particular, were less likely to support replacing CT with alternative imaging techniques, reflecting their confidence in CT's superior diagnostic capabilities.

CT imaging remains a cornerstone of sepsis diagnosis, providing rapid and detailed insights that are critical for identifying infectious foci and guiding treatment. Despite concerns about radiation exposure and contrast media risks, most physicians support its use in septic patients, considering it an essential diagnostic tool. However, the variation in perspectives regarding contrast administration, repeat imaging and the use of alternative modalities highlights the need for further research and standardised protocols. By refining evidence-based guidelines, healthcare professionals can optimise the use of CT in sepsis management, ensuring the best possible outcomes for patients while mitigating unnecessary risks.

Source: **Insights into Imaging**

Image Credit: **iStock**

Published on : Sun, 2 Feb 2025