

# Infectious Disease Consultation in Postoperative Septic Patients: Impact on Outcomes

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## Introduction

- Sepsis is a progressive disease characterized by life-threatening organ dysfunction and the body’s dysregulated response to infection. The triggers for sepsis can include bacteria, fungi, and viruses.
- It may be difficult to identify septic patients because they can present with or without a fever, altered urine output, hypoxia, tachycardia, hypotension, feeling generally unwell, etc.<sup>1</sup>
- The Surviving Sepsis Campaign encourages medical professionals to identify septic patients and start adequate antimicrobials as rapidly as possible, as the longer it takes for treatment and identification, the higher the mortality.<sup>2,3</sup>
- Despite the current knowledge and methods of treatment, it is estimated that 5.3 million patients die of septic diseases worldwide.<sup>4</sup>
- The American College of Chest Physicians and Society of Critical Care Medicine define postoperative sepsis as infection-related sepsis, severe sepsis, or septic shock occurring after surgery.<sup>5</sup> Postoperative sepsis occurs in approximately 1.8% of surgical patients and is linked to increased mortality, mechanical ventilation, hospital stay, costs, and antibiotic use.<sup>6</sup>
- Infectious disease (ID) consultation in sepsis management has been linked to reduced mortality, mechanical ventilation, hospital stay, costs, and antibiotic use.<sup>7,8</sup>
- Collaboration and timely consultation between the primary and ID teams are key to improved outcomes.<sup>7,9</sup>
- Prior studies highlight the benefits of collaboration between infectious disease (ID) and Intensive Care Unit (ICU) teams,<sup>10,11</sup> but this has not been specifically examined in postoperative sepsis. Existing Surgical ICU (SICU) studies focus on pharmacist collaboration, cost-effectiveness, or comparison of ID and surgical recommendations,<sup>12–14</sup> leaving a gap regarding how direct ID–SICU collaboration influences outcomes.

## Aims and Objectives

- This study aimed to evaluate the relationship between infectious disease (ID) consultation and clinical outcomes in postoperative sepsis patients admitted to the surgical intensive care unit (SICU).
  - Specifically, we sought to assess whether the presence of an ID consult was associated with differences in SICU length of stay, mortality, and the development of septic shock.

## Methods

- A retrospective chart review of the Electronic Medical Record (EMR), Epic, used by Corewell Health Royal Oak was completed. Data was securely stored and included adult patients admitted to the SICU for a surgical procedure between January 1 and December 31, 2019, who developed sepsis.
- Variables collected included ID consultation status, SICU length of stay, in-hospital mortality, and development of septic shock.
  - Demographics (age, sex, race) were recorded for context and generalizability.
- Patients with informal ID consultations (undocumented recommendations) were excluded.
- For patients with multiple SICU transfers, total SICU time was aggregated.
- Death was defined as in-hospital death or discharge to hospice with a terminal prognosis.
- Two-sample t-tests compared quantitative variables (e.g., age, SICU LOS), and chi-square tests were used for categorical variables (sex, race, mortality, septic shock).

## Results

- A total of 320 postoperative SICU patients with sepsis were included; 217 (67.8%) received an ID consultation and 103 (32.2%) did not.
- This study compared SICU length of stay, age, sex, race, in-hospital mortality, and septic shock.
- Continuous variables were summarized as mean (SD), median, and range, while categorical variables were reported as counts and percentages.

| Comparison of those that did and did not receive an infectious disease consult |                 |                 |                 |                     |
|--------------------------------------------------------------------------------|-----------------|-----------------|-----------------|---------------------|
|                                                                                | ID CONSULT      |                 |                 |                     |
|                                                                                | no (N=103)      | yes (N=217)     | Total (N=320)   | P-value             |
| SICU LOS (hours)                                                               |                 |                 |                 | 0.0451 <sup>1</sup> |
| N                                                                              | 103             | 217             | 320             |                     |
| Mean (SD)                                                                      | 214.57 (373.57) | 307.34 (390.87) | 277.48 (387.24) |                     |
| Median                                                                         | 101.73          | 162.02          | 138.98          |                     |
| Range                                                                          | 1.57, 2858.98   | 1.15, 2499.95   | 1.15, 2858.98   |                     |
| age                                                                            |                 |                 |                 | 0.0012 <sup>1</sup> |
| N                                                                              | 103             | 217             | 320             |                     |
| Mean (SD)                                                                      | 70.06 (16.15)   | 64.13 (14.74)   | 66.04 (15.43)   |                     |
| Median                                                                         | 71.00           | 66.00           | 67.00           |                     |
| Range                                                                          | 27.00, 96.00    | 19.00, 94.00    | 19.00, 96.00    |                     |
| SEX, n (%)                                                                     |                 |                 |                 | 0.7196 <sup>2</sup> |
| Female                                                                         | 53 (51.5%)      | 107 (49.3%)     | 160 (50.0%)     |                     |
| Male                                                                           | 50 (48.5%)      | 110 (50.7%)     | 160 (50.0%)     |                     |
| RACE, n (%)                                                                    |                 |                 |                 | 0.4907 <sup>2</sup> |
| Asian                                                                          | 2 (1.9%)        | 8 (3.7%)        | 10 (3.1%)       |                     |
| Black or African American                                                      | 22 (21.4%)      | 53 (24.4%)      | 75 (23.4%)      |                     |
| Other                                                                          | 1 (1.0%)        | 6 (2.8%)        | 7 (2.2%)        |                     |
| White or Caucasian                                                             | 78 (75.7%)      | 150 (69.1%)     | 228 (71.3%)     |                     |
| death?, n (%)                                                                  |                 |                 |                 | 0.2110 <sup>2</sup> |
| no                                                                             | 71 (68.9%)      | 134 (61.8%)     | 205 (64.1%)     |                     |
| yes                                                                            | 32 (31.1%)      | 83 (38.2%)      | 115 (35.9%)     |                     |
| shock?, n (%)                                                                  |                 |                 |                 | 0.6736 <sup>2</sup> |
| no                                                                             | 17 (16.5%)      | 40 (18.4%)      | 57 (17.8%)      |                     |
| yes                                                                            | 86 (83.5%)      | 177 (81.6%)     | 263 (82.2%)     |                     |

- SICU Length of Stay: Patients who received an ID consultation had a significantly longer average SICU stay (307.3 vs. 214.6 hours,  $p = 0.0451$ ).
- In-Hospital Mortality: Mortality was slightly higher among patients with an ID consult (38.2%) compared to those without (31.1%), though not statistically significant ( $p = 0.2110$ ).
- Septic Shock: Rates of septic shock were similar between groups (81.6% vs. 83.5%,  $p = 0.6736$ ).
- Age: Patients who received an ID consult were significantly younger on average (64.1 vs. 70.1 years,  $p = 0.0012$ ).

## Conclusions

- ID consultation was associated with a significantly longer SICU stay, likely reflecting use in more complex or prolonged cases rather than a causal effect.
- Patients who received an ID consult were younger by about five years; however, this difference may suggest variation in treatment goals or care intensity among older patients.
- No significant differences were observed in mortality or incidence of septic shock.
- Findings should be interpreted cautiously given the retrospective design, small sample size, and potential confounders.
- Future prospective studies should explore the timing and indications for ID consultation and its impact on outcomes in postoperative sepsis.

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