

# Antimicrobial Use at the End of Life



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## KEYWORDS

• Antimicrobials • Antibiotics • End of life • Palliative care

## KEY POINTS

- Antimicrobials are overused in the final weeks of life.
- Common goals of antimicrobial use at the end of life are prolongation of survival and relief of symptoms.
- End-of-life patients are a heterogeneous population. Antimicrobials are more likely to achieve specific goals within some subgroups than others.
- Decisions regarding antimicrobial use at the end of life should incorporate the patients' goals and the likelihood of achieving those goals.

## INTRODUCTION

Health care providers of patients at the end of life (EOL) have the responsibility of reevaluating an evolving balance between potential benefits and harms of a variety of otherwise common medical interventions. Medicine is failing at this task across many medical specialties. Recent data suggest that 33% to 38% of patients at the EOL receive interventions that they are unlikely to benefit from, and 22.4% to 42% of patients die in the intensive care unit (ICU).<sup>1,2</sup> These statistics include antimicrobial use, which tends to be one of the last interventions withdrawn or withheld, with 27% to 88% of patients receiving antimicrobials during the final weeks of life.<sup>3-7</sup> In EOL patients with documentation of a suspected infection, antimicrobials are withheld in a small number of cases.<sup>8</sup> For example, as many as 92% to 100% of patients with cancer receiving hospice and palliative care are treated with antimicrobials in this setting.<sup>8</sup> This high rate of antimicrobial use may be because providers view antimicrobials differently from invasive interventions, such as mechanical ventilation and cardiopulmonary resuscitation. Many providers may believe that antimicrobials carry a lower potential for harm.

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Although there is a high utilization of antimicrobials at the EOL, data suggest that much of this use is in the absence of a documented infection. One study found that 15.6% of patients who transitioned to a comfort care protocol remained on antimicrobials, and 31% of those on antimicrobials did not have a documented infectious diagnosis.<sup>9</sup> Another study found that among hospice patients who received antibiotics in the last 7 days of life, only 15% had a documented infectious diagnosis.<sup>3</sup> These high rates of antimicrobial use delineate the importance of clearly defining the goals of these therapies in patients at the EOL. To date, most available data on antimicrobial use at the EOL are retrospective.<sup>10</sup> Not only are prospective studies uncommon but ethical considerations also limit the feasibility of randomized controlled trials.<sup>11,12</sup> Consensus guidelines were previously unavailable. However, newly published antimicrobial stewardship guidelines by the Infectious Diseases Society of America have broached the subject of antimicrobials at the EOL by suggesting that antimicrobial stewardship programs should provide support to clinicians in decisions related to antibiotic use.<sup>13</sup>

### **PATIENT POPULATIONS AND POPULATION-SPECIFIC CONSIDERATIONS**

For this review, EOL is defined as the final weeks before death. The most commonly studied patient populations are those with advanced dementia, those with advanced malignancies, and those enrolled in hospice programs. Studies in palliative care units and hospice programs often include mixed populations. Because data on antimicrobial use at the EOL are limited, studies from one patient population may guide others. However, it is important to keep patient-specific nuances in mind.

A study by Ahronheim and colleagues<sup>6</sup> compared management of patients with metastatic solid tumors to those with advanced dementia before their deaths at a tertiary care hospital. These 2 groups of patients had similar rates of nonpalliative invasive treatments (eg, hemodialysis, enteral tube feeding) and cardiopulmonary resuscitation attempts. Patients with cancer were more likely to receive invasive (eg, lumbar puncture, bronchoscopy) and noninvasive (eg, blood work, radiographs) diagnostic testing, much of which was for suspected infection. The overall rate of antibiotic administration in the 2 groups was high at 88%, most of which was empiric, particularly for patients with cancer.

Patients with cancer at the EOL have been found to receive antibiotics more often than advanced dementia patients, frequently in the absence of a documented infection.<sup>3,14</sup> These results highlight not only overall similarities but also subtle differences in health care providers' approaches to these 2 EOL populations. Some of these differences may reflect the tempo of the underlying disease process. In advanced dementia patients in whom deterioration typically occurs over a longer period of time, patients, families, and providers may alter their approach to medical management decisions by favoring less aggressive measures with each stepwise decline in overall health. In advanced cancer where a more acute deterioration can occur, patients, families, and providers may be attached to the goal for cure or prolongation of life, thereby favoring more aggressive diagnostic and treatment strategies.

Noninfectious fever is an important reason for overuse of antimicrobials and may occur at different rates in patients with malignancies and dementia. When fever occurs without other localizing signs of infection, alternative causes of an elevated temperature such as drug-induced, venous thromboembolism and neoplastic fever should be considered. Although patients both with dementia and with cancer can develop noninfectious fever, this diagnosis is particularly relevant to patients with advanced malignancies. The finding that antimicrobials are used empirically more often in patients

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