Ethical Issues Relating to the Use of Antimicrobial Therapy in Older Adults

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This article aims to review the literature relating to the ethics of antibiotic prescription decisions in older adults and to offer some suggestions as to how one might approach these difficult problems. According to many studies, most patients and their family members wish to receive antibiotics even when they are terminally ill or suffering from advanced dementia. Health care professionals are also frequently reluctant to deny the use of antibiotics in such situations. We suggest that the difficult decisions regarding whether one should withhold treatment can be based on consideration of the ethical principles of autonomy, beneficence, nonmaleficence, and justice. From the public health point of view, one should also take into account the need to avoid the emergence of antimicrobial resistance, keeping in mind the balance between the benefit to the specific patient and the cost to future patients. Infectious diseases consultants should actively participate in these ethical dilemmas.

In the first edition of The Principles and Practice of Medicine, published in 1892, Osler initially described pneumonia as “the special enemy of old age” [1], but by the third edition [2], he had changed his tune: “Pneumonia may well be called the friend of the aged. Taken off by it in an acute, short, not often painful illness, the old man escapes those ‘cold gradations of decay’ so distressing to himself and to his friends.” Ironically, in the preantibiotic era, Osler himself died of a lung infection after a prolonged illness of ~3 months [3]. Today, the actual demise of many patients with any form of end-stage illness—whether cancer, cardiac or pulmonary disease, dementia, or diabetes—is most likely to be caused by an infection [4, 5].

Most of the literature regarding the ethics of end-of-life care and the treatment of patients with severe dementia focuses on issues of resuscitation and the use of high technology. The ethical issues concerning the use of antibiotics are discussed much less frequently. This article aims to critically review the literature relating to ethics of antibiotic-prescribing decisions in older adults. We will examine the current use of antibiotics in the terminally ill and frail hospitalized older adults and those studies that have explored the opinions of patients, families, and professionals regarding such therapy. In addition, we urge the inclusion of infectious disease consultants in the decision-making process. Finally, we offer some guidelines for decision making.

MATERIALS AND METHODS

We performed a computer search of the MEDLINE, BIOETHICSLINE, and AgeLine databases for the terms “ethics” and “antibiotics,” and we followed up all relevant bibliographic references.

ETHICAL PRINCIPLES

When discussing ethical issues, it is helpful to refer to the 4 basic ethical principles as offered by Beauchamp and Childress [6]: “autonomy” (literally, self-rule) offers us the ability to make our own decisions on the basis of deliberation; “beneficence” and “nonmaleficence” indicate that whenever we try to help others, we inevitably risk harming them (these 2 principles are usually considered together); and “justice” is the moral obligation to act on the basis of fair adjudication between competing claims.

PREVALENCE AND IMPACT OF ANTIBIOTIC USE AMONG TERMINALLY ILL AND FRAIL OLDER ADULTS

A few surveys have explored the prevalence of the use of antibiotics in termi-
nally ill patients [7–14], the results of which are summarized in table 1. In most studies, a significant proportion of terminally ill patients continued to receive antibiotics, which is consistent with the view that physicians may find the administration of these drugs “routine” and less subject to either withdrawal or withholding. Physicians may feel more comfortable in continuing to try to correct a theoretically reversible condition by use of antibiotics even in the face of an irreversible dying process.

Indeed, withholding antibiotics may sometimes cause an increase in mortality rates. For example, among patients in an extended care facility, withholding therapy during febrile episodes was associated with significantly higher mortality rates when compared with patients who received antibiotics (59% vs. 9%) [15].

In contrast, and perhaps not surprisingly, given the attitude toward physician-assisted suicide, the attitude toward withholding antibiotics is often different in The Netherlands. In 2 national surveys, antibiotics were among the interventions withheld from dying patients most frequently [16, 17]. The decision not to offer antibiotics was taken in patients typically aged ≥65 years and more frequently by nursing-home physicians than by general practitioners or other specialists.

A debate regarding antibiotic therapy for patients with advanced dementia has also begun. Volicer et al. [18] have suggested a hospice approach that may also include, in conjunction with the family’s wishes, forgoing antibiotics. The same group [19] prospectively evaluated institutionalized patients with Alzheimer’s disease to determine the impact of antibiotics on survival. Their patients were not randomly assigned to receive antibiotics or not (in part for ethical reasons); rather, the assignments were made according to a joint decision of staff and family. Surprisingly, the incidence of fever was similar for both groups. Survival analysis revealed that, for the patients with more-severe dementia, there was no difference in survival rates between the groups. Among the less severely affected patients, survival rates were approximately twice the rates for those who received antibiotics. This lack of efficacy of antibiotics in persons with severe dementia may be explained, at least in part, by the fact that infections in this patient population tend to be recurrent and are increasingly caused by resistant organisms [20]. The same authors reported that a significantly higher degree of discomfort occurred during episodes of fever in patients with dementia who had been treated aggressively in standard long-term care units, as compared with those who were looked after in a hospice [21–23]. However, the estimated mortality rate for patients with lower severity of dementia was 7 times higher in the

Table 1. Prevalence of antibiotic use among terminally ill, hospitalized, elderly patients.

<table>
<thead>
<tr>
<th>Author [reference]</th>
<th>Country</th>
<th>Population surveyed</th>
<th>Type of study</th>
<th>No. of subjects</th>
<th>Age, years</th>
<th>Receipt of antibiotic therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ahronheim et al. [7]</td>
<td>USA</td>
<td>Patients with terminal dementia or metastatic</td>
<td>Chart review</td>
<td>164</td>
<td>≥65</td>
<td>88% of all patients</td>
</tr>
<tr>
<td>Faber-Langendoen [8]</td>
<td>USA</td>
<td>Patients dying in hospitals</td>
<td>Chart review</td>
<td>274</td>
<td>Mean, 64</td>
<td>75% of patients for whom antibiotic therapy was considered</td>
</tr>
<tr>
<td>Eidelman et al. [9]</td>
<td>Israel</td>
<td>Patients in ICU who died and had a decision to forgo life-sustaining treatment</td>
<td>Prospective</td>
<td>52</td>
<td>Mean, 57</td>
<td>100% of patients for whom antibiotic therapy was considered</td>
</tr>
<tr>
<td>Brown et al. [10]</td>
<td>USA</td>
<td>Terminally ill hospitalized pancreatic cancer patients</td>
<td>Chart review</td>
<td>417</td>
<td>69% were ≥60</td>
<td>29% of 70 febrile patients</td>
</tr>
<tr>
<td>Goodlin et al. [11]</td>
<td>USA</td>
<td>Hospitalized patients 2 days prior to death; 46% had comfort care plans</td>
<td>Chart review</td>
<td>104</td>
<td>Mean, 69</td>
<td>55% and 32% of all patients and of patients with comfort care plans respectively</td>
</tr>
<tr>
<td>Fins et al. [12]</td>
<td>USA</td>
<td>Patients dying at hospital; 46% had comfort care plans</td>
<td>Chart review</td>
<td>200</td>
<td>Mean, 68</td>
<td>41% of patients with comfort care plans</td>
</tr>
<tr>
<td>Pereira et al. [13]</td>
<td>Canada</td>
<td>Patients with cancer hospitalized in a palliative care unit</td>
<td>Chart review</td>
<td>100</td>
<td>Mean, 64</td>
<td>72% of febrile patients</td>
</tr>
<tr>
<td>Alpert and Emanuel [14]</td>
<td>USA</td>
<td>Patients in coma with small chance of recovery</td>
<td>Chart review</td>
<td>167</td>
<td>Mean, 56</td>
<td>68% of patients for whom antibiotic therapy was considered</td>
</tr>
</tbody>
</table>

NOTE. ICU, Intensive care unit; USA, United States of America.
hospice approach than it was for those who received antibiotics.

Those authors argued that, because antibiotics did not prolong the duration of survival in patients with severe dementia, such therapy may be considered futile. They did feel that, in patients with less-severe dementia, one should weigh the burden of treatment against its possible benefits.

We do not claim that all of the difficulty in making such decisions evolves purely from ethical concerns. In all systems of care, the specific structure, payment mechanism, and clinical culture can all influence decision making. For example, the recent rise in the influence of managed care in the United States could well have pushed physicians toward decisions other than those that they would ideally have preferred [24].

PATIENTS’ ATTITUDES

In 1989, Emanuel and Emanuel [25] proposed a specific and comprehensive advanced care document called the Medical Directive. In that document, 4 paradigmatic scenarios were delineated: (1) irreversible coma or a persistent vegetative state but with no terminal illness, (2) coma with small and uncertain chance of recovery, (3) brain damage causing mental incompetence and terminal illness, and (4) mental incompetence without terminal illness. In each scenario, the patient is to indicate whether he or she would or would not want interventions ranging from cardiopulmonary resuscitation (CPR) to antibiotic therapy. The attitudes of different patient populations toward administration of antibiotics has been investigated in many studies by use of questionnaires that present different hypothetical scenarios [14, 26–34] corresponding either to their current health status or to scenarios similar to those mentioned in the advance medical directive form. Other studies have reviewed the content of advance care directives [35] and the Physician Order for Life-Sustaining Treatment (POLST), which is a structured form developed to help health care providers honor their patients’ end-of-life treatment desires [36, 37]. Regarding antibiotics, the options of the POLST are “no antibiotics except for comfort,” “no invasive (im/iv) antibiotics,” and “full treatment.” The results of those studies are detailed in table 2.

In those surveys, antibiotics were among the least refused therapeutic options and, perhaps not surprisingly, were less often refused than were CPR and mechanical ventilation (data not shown) in all hypothetical scenarios. However, the more severe the clinical situation perceived, the greater the percentage of patients who refused antibiotics. The rate of antibiotic refusal ranged from 2%, for a hypothetical scenario that involved current health status, to 82%, for a hypothetical scenario that involved coma.

ATTITUDES OF FAMILIES

In many cases, relatives participate in treatment decisions. Studies summarized in table 3 [28, 32, 38, 39] investigated the attitudes of family members toward various life-sustaining interventions. The attitudes were similar to those of patients: antibiotics were the treatment that family members were least willing to forgo. The rate of antibiotic refusal ranged from 0%, for a hypothetical scenario that involved current health status, to 72%, in a hypothetical scenario that involved a persistent vegetative state.

ATTITUDES OF HEALTH CARE PROFESSIONALS

Asch and Christakis [40] asked 456 internists to rank different forms of life support in terms of willingness to withdraw them from critically ill patients. For the physicians, withdrawal of blood products was preferred to withdrawal of antibiotics, but they were more willing to withdraw antibiotics than they were to withdraw mechanical ventilation or iv fluids. Infectious disease specialists did not differ from other specialists with regard to attitudes toward withdrawal of antibiotics [41].

The same study group performed a chart review of 211 patients who died in acute-care hospitals [42] and reported that the order of withdrawing life support was similar to that in the interview study, except that mechanical ventilation was withdrawn before antibiotics.

Other studies (summarized in table 4) investigated the attitudes of practitioners toward the withholding or withdrawing of antibiotics in various hypothetical clinical scenarios [43–47]. As was the case for patients and their families, antibiotic therapy was the intervention that practitioners were least willing to withhold.

Wanzer et al. [48] defined 4 levels of care: (1) emergency resuscitation, (2) intensive care and advanced life support, (3) general medical care (including antibiotics, surgery, etc.), and (4) comfort care. They believe that the physician, patient, family, and other health care personnel together should make the decision regarding what level of care to assign to a patient. They hold that those who receive comfort care should be clearly in the terminal phase of an irreversible illness, including dementia.

On the other hand, Loewy [49] claims that treating a patient with severe dementia patient for pneumonia may be justified, because such an infection poses an immediate threat at the time when the patient still has a reasonable short-term ability to “profit from life.” Similarly, Loewy claims that such treatment entails the relief of suffering, involves little addition of discomfort, and does not require enlisting the patient’s sustained cooperation to accomplish therapeutic goals. Likewise, others [50–52] feel that, for patients with a terminal illness, antibiotics can be a part of comfort care.

However, one could argue that, in cases in which quality of life is so poor that life itself is not worth living, any treatment that extends life, no matter
<table>
<thead>
<tr>
<th>Author [reference]</th>
<th>Country</th>
<th>Population surveyed</th>
<th>Type of study</th>
<th>No. of subjects</th>
<th>Age, years</th>
<th>Hypothetical scenario</th>
<th>Percentage of subjects who would refuse Antibiotics</th>
<th>CPR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ainslie and Beisecker [26]</td>
<td>USA Community elderly patients</td>
<td>Questionnaire</td>
<td>151</td>
<td>Not detailed</td>
<td></td>
<td>Current health status</td>
<td>2</td>
<td>—</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td>Stroke</td>
<td>30</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Early Alzheimer's disease</td>
<td>41</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Late Alzheimer's disease</td>
<td>66</td>
<td>—</td>
</tr>
<tr>
<td>Reilly et al. [27]</td>
<td>USA Community patients</td>
<td>Questionnaire</td>
<td>218</td>
<td>≥60; median, 69</td>
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<td>Current health status</td>
<td>2</td>
<td>10</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>Moderate Alzheimer's disease</td>
<td>27</td>
<td>46</td>
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<td></td>
<td>Terminal illness</td>
<td>43</td>
<td>67</td>
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<td></td>
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<td></td>
<td></td>
<td>Coma</td>
<td>49</td>
<td>67</td>
</tr>
<tr>
<td>Roberto and Matheis-Kraft [28]</td>
<td>USA Community patients</td>
<td>Questionnaire</td>
<td>62</td>
<td>≥75, mean, 80</td>
<td></td>
<td>Current health status</td>
<td>3</td>
<td>34</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td>Dementia</td>
<td>26</td>
<td>99</td>
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<td>Gjerdingen et al. [29]</td>
<td>USA Cognitively normal residents of nursing homes and assisted living units</td>
<td>Questionnaire</td>
<td>84</td>
<td>≥65; mean, 81</td>
<td></td>
<td>Terminal illness</td>
<td>4</td>
<td>31</td>
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<td></td>
<td></td>
<td>Mild dementia</td>
<td>25</td>
<td>73</td>
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<td></td>
<td></td>
<td></td>
<td>Moderate dementia</td>
<td>45</td>
<td>76</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Severe dementia</td>
<td>64</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>End-stage dementia</td>
<td>75</td>
<td>96</td>
</tr>
<tr>
<td>Patrick et al. [30]</td>
<td>USA Young and older adults with chronic conditions, terminal cancer or AIDS, and stroke survivors and nursing home patients</td>
<td>Interview</td>
<td>341</td>
<td>≥25</td>
<td></td>
<td>Current health status</td>
<td>5</td>
<td>23</td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td>Dementia</td>
<td>20</td>
<td>60</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Severe stroke</td>
<td>28</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Severe pain</td>
<td>39</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coma</td>
<td>62</td>
<td>95</td>
</tr>
<tr>
<td>Lo et al. [31]</td>
<td>USA Outpatients from internal medicine practice who had cancer, chronic diseases, or were healthy</td>
<td>Questionnaire</td>
<td>152</td>
<td>Most were ≥65</td>
<td></td>
<td>Severe dementia</td>
<td>53</td>
<td>71</td>
</tr>
<tr>
<td>Gerety et al. [32]</td>
<td>USA Patients in nursing homes who were disabled and mildly demented</td>
<td>Interview</td>
<td>52</td>
<td>Mean, 70</td>
<td></td>
<td>Current health status</td>
<td>2</td>
<td>29</td>
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<td></td>
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<td></td>
<td></td>
<td>Severe physical disability</td>
<td>35</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>Persistent vegetative state</td>
<td>62</td>
<td>—</td>
</tr>
<tr>
<td>Schiff et al. [33]</td>
<td>England Medical inpatients</td>
<td>Interview</td>
<td>74</td>
<td>≥65; mean, 81</td>
<td></td>
<td>End-stage terminal illness</td>
<td>82</td>
<td>90</td>
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<tr>
<td>Alpert and Emanuel [14]</td>
<td>USA Medical outpatients</td>
<td>Interview</td>
<td>495</td>
<td>Mean, 65</td>
<td></td>
<td>Coma with small chance of recovery</td>
<td>48</td>
<td>56</td>
</tr>
<tr>
<td>Goodman et al. [35]</td>
<td>USA Patients in the ICU with advanced directive</td>
<td>Document survey</td>
<td>19</td>
<td>≥65</td>
<td></td>
<td>End of life</td>
<td>42</td>
<td>100</td>
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<tr>
<td>Lee et al. [36]</td>
<td>USA Community elderly patients who died and had a POLST document</td>
<td>Document survey</td>
<td>54</td>
<td>Mean, 84</td>
<td></td>
<td>End of life</td>
<td>7</td>
<td>93</td>
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<tr>
<td>Tolle et al. [37]</td>
<td>USA Nursing home patients who had a POLST document</td>
<td>Document survey</td>
<td>180</td>
<td>Mean, 83</td>
<td></td>
<td>End of life</td>
<td>39/43a</td>
<td>100</td>
</tr>
</tbody>
</table>

**NOTE.** ICU, intensive care unit; POLST, physician order for life-sustaining treatment; USA, United States of America.

*a* Percentage of patients who refused oral antibiotics/percentage who refused iv antibiotics.
how simple the treatment is, offers more burden than benefit [49, 53]. Ahronheim et al. [7] argue that antibiotics might well even prolong suffering in some situations, and that comfort measures, such as sedation, may be used as palliation.

**OPINIONS OF PROFESSIONAL BODIES**

In 1998, the Council of Ethical and Judicial Affairs of the American Medical Association stated, “The social commitment of the physician is to sustain life and relieve suffering. Where the performance of one conflicts with the other, the preferences of the patient should prevail. The principle of patient autonomy requires that physicians respect the decision to forgo life-sustaining treatment of a patient who possesses a decision-making capacity. Life-sustaining treatment is any treatment that serves to prolong life without reversing the underlying medical condition. Life-sustaining treatment may include…mechanical ventilation…antibiotics…There is no ethical distinction between withdrawing and withholding life-sustaining treatment” [54].

The Long-Term-Care Committee of the Society for Health Care Epidemiology of America, in discussing guidelines for antimicrobial prescription in long-term care facilities, recommends, “Guidelines should be developed for the use of antimicrobials for patients for whom comfort measures only are being provided” [55]. Indeed, some of the limited-treatment policies in long-term care facilities include providing antibiotics only as a second-line treatment for pneumonia, to be used after antipyretics and analgesics do not adequately palliate [56–58]. Obviously, different jurisdictions with varying legal systems, ethical systems, and history will demonstrate varying approaches to these challenges. We do not expect to see the development of a “consistent” approach among industrialized countries, given the extent of intra- and intercountry variability. For example, although many physicians in The Netherlands have a relatively “liberal” approach to end-of-life decisions, we cannot necessarily expect to see such practices becoming commonplace everywhere.

**ETHICAL CONSIDERATIONS**

**Futility.** A major consideration in deciding whether to use antimicrobials is whether such care is considered futile. “Medical futility” refers to an intervention that is unlikely to produce any significant benefit for the patient [59]. Schneiderman et al. [60, 61] distinguish between 2 kinds of futility: “quantitative futility,” in which the likelihood that an intervention will benefit the patient is exceedingly poor (<1%); and “qualitative futility,” in which the quality of benefit is exceedingly poor. If the treatment merely preserves permanent unconsciousness or fails to end total dependence on intensive medical care, physicians should consider such treatment futile. According to Schneiderman et al., futile interventions are ill-advised because they often increase the terminal patient’s discomfort and because they expend finite resources [60, 61].

In that vein, Miller [4] discusses 2 situations for which withholding antibiotics may be considered ethically sound. The first are situations in which antibiotics offer neither comfort nor prolongation of life. The second situation occurs when the patient’s quality of life has deteriorated such that the patient himself would not consider prolongation to be beneficial. In that case, the decision should involve discussion with the patient or the legal proxy.

Youngner [62] holds that a given intervention is futile if it fails to achieve a specific goal yet can simultaneously be futile in achieving one goal and quite successful in attaining another. He suggests that discussion with patients and families should not be focused on specific questions, such as “Do you want antibiotic

<table>
<thead>
<tr>
<th>Author [reference]</th>
<th>Country</th>
<th>Population surveyed</th>
<th>Type of study</th>
<th>No. of subjects</th>
<th>Hypothetical scenario</th>
<th>Percentage of subjects who would refuse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roberto and Matheis-Kraft [28]</td>
<td>USA</td>
<td>Proxies of community-dwelling adults &gt;75 years</td>
<td>Questionnaire</td>
<td>124</td>
<td>Current health status</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Dementia</td>
<td>3</td>
</tr>
<tr>
<td>Mezey et al. [38]</td>
<td>USA</td>
<td>Spouses of patients with Alzheimer’s disease</td>
<td>Questionnaire</td>
<td>50</td>
<td>Critical illness</td>
<td>10</td>
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<td></td>
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<td>Coma</td>
<td>68</td>
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<td>Potkiss et al. [39]</td>
<td>UK</td>
<td>Proxies of people with dementia</td>
<td>Questionnaire</td>
<td>50</td>
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<td>22/36</td>
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<td>Gerety et al. [32]</td>
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<td></td>
<td></td>
<td>Severe physical disability</td>
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<td></td>
<td>Persistent vegetative state</td>
<td>—</td>
</tr>
</tbody>
</table>

**NOTE.** UK, United Kingdom; USA, United States of America.

* Percentage of patients who refused oral antibiotics/percentage who refused iv antibiotics.

Table 3. Family members’ opinions about antibiotic therapy and cardiopulmonary resuscitation (CPR) in hypothetical clinical scenarios.
therapy?” but, rather, should explore which potential outcomes are desirable.

Another problematic situation occurs when the treatment benefit is real but small and is easily overwhelmed by an aggressive approach to diagnosis or therapy. In that case, Miller [4] suggests an intermediate approach that includes limited investigations, easily administered medications (e.g., oral versus iv administration), and providing comfort rather than seeking diagnostic and treatment precision. Other authors [27] have suggested a trial of antibiotics when appropriate. Those approaches may be comforting for both medical staff and family.

Public health issues. Lachmann [63] discusses the conflict between the priorities of public health and the emphasis of traditional medical ethics on the doctor’s duty to the individual patient. The ethical conflict lies between the individual patient’s right to receive the “best” antibiotic and the need to decrease the future number of drug-resistant pathogens [64, 65]. Thus, the choice lies between the interests of present and the interests of future patients [66]. In the current era of widespread resistance, “optimal” individual treatment often necessitates the administration of a second- and third-generation agent. This practice increases the danger to other patients, who perhaps have a better prognosis, because their environment becomes infested with highly resistant organisms [4, 63, 67, 68]. The American College of Physicians’ Ethics Manual states that “All physicians must fulfill the profession’s collective responsibility to advocate the health and well-being of the public” [69]. Thus, the principle of nonmaleficence should be applied not only to the individual patient, but also to the community at large. In the case of terminal illness, when the benefit of antibiotics is less certain, the balance between the potential advantage to the individual tilts more toward the interest of the collective.

Ethical issues concerning the individual patient. Some authors have argued that antibiotics are a part of “ordinary care” and that even the terminally ill should not be denied this treatment [70–72]. Persons who hold this position claim that a decision not to resuscitate that is made solely on the basis of prognosis should not necessarily mean depriving the patient of antibiotics [73–75].

Religious law also influences the debate. For example, according to Jewish law (Halacha), a physician may consider withholding certain therapies from a terminally ill patient who is suffering [76, 77]. Treatments that are “artificial” and aimed at the direct treatment of the terminal illness itself, such as mechanical ventilation, could be withheld, whereas those that are “natural” and aimed at the correction of potentially treatable situations, such as antibiotics, must be continued.

Coni [73] claims that one might even consider the practice of not prescribing antibiotics for a fatal pneumonia in a patient with terminal colonic cancer to be “passive euthanasia.” In judging whether this decision is ethical, the primary intention of the physician is important. If the action is taken to relieve distress, then it will usually be considered part of palliative care. This is according the ethical principle known as the “rule of double effect,” in which effects that would be morally wrong if they were caused inten-

Table 4. Opinions of health care workers regarding the withholding of antibiotic therapy and cardiopulmonary resuscitation (CPR) in hypothetical clinical scenarios.

<table>
<thead>
<tr>
<th>Author [reference]</th>
<th>Country</th>
<th>Population surveyed</th>
<th>No. of subjects</th>
<th>Clinical scenario presented</th>
<th>Antibiotics</th>
<th>CPR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waddell et al. [43]</td>
<td>Australia</td>
<td>Physicians nationwide and palliative care practitioners</td>
<td>1588</td>
<td>80-year-old woman with Alzheimer’s disease and acute myocardial infarction</td>
<td>55</td>
<td>96</td>
</tr>
<tr>
<td>Mower and Baraff [44]</td>
<td>USA</td>
<td>Physicians in a department of medicine</td>
<td>444</td>
<td>72-year-old patient with metastatic cancer, fever, and altered mental status with an advanced directive denying life-sustaining treatment</td>
<td>28/80&lt;sup&gt;a&lt;/sup&gt;</td>
<td>90</td>
</tr>
<tr>
<td>Marin et al. [45]</td>
<td>England</td>
<td>Hospital physicians</td>
<td>833</td>
<td>Terminally ill patient with metastatic cancer</td>
<td>84</td>
<td>—</td>
</tr>
<tr>
<td>Ghush et al. [46]</td>
<td>USA</td>
<td>Nursing home medical directors</td>
<td>33</td>
<td>Request of a medically stable resident</td>
<td>27</td>
<td>66</td>
</tr>
<tr>
<td>Gillick and Mendes [47]</td>
<td>USA</td>
<td>Nurses working in a nursing home</td>
<td>102</td>
<td>Healthy 85-year-old patient</td>
<td>26</td>
<td>92</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Dementia</td>
<td>26</td>
<td>92</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Dementia plus chronic illness</td>
<td>51</td>
<td>96</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Terminal illness</td>
<td>75</td>
<td>99</td>
</tr>
</tbody>
</table>

NOTE. USA, United States of America.
<sup>a</sup> Percentage with an advanced directive that states antibiotic refusal/percentage without such an agreement.
tionally, but they would be permissible if they were unintended [78].

The prognosis of the patient’s underlying disease is an important factor in the consideration of antimicrobial therapy. For example, patients who have just sustained a stroke should be treated aggressively, even though the patient might have severe neurological impairment, because the prognosis is not yet clear. However, with time, if the neurological condition has not improved, the decision to withhold therapy may become ethically supportable [79]. Callahan et al. [80, 81] and Givetta [82] have gone even further; they have claimed that one should avoid even the painless use of antibiotics in a patient whose course is most likely going steadily downhill.

**Limited health care resources.** Another important aspect is the impact of the increased costs of care of infectious diseases in terms of the ethical principle of justice. Gleckman [83] raises the dilemma that arises from the pressure to limit the use of scarce health resources, especially for elderly patients. Regarding antimicrobials, this argument is especially relevant, given the ongoing introduction of new and increasingly expensive agents. Gleckman argues that clinicians must serve as the patient’s advocate and avoid a policy that discriminates against elderly persons. Callahan [84] takes the opposite approach: in general, Callahan justifies the refusal to treat many conditions in elderly individuals, not only infections.

In the cases in which the administration of antimicrobials is considered futile, some authors argue that providing such care wastes resources and it is the physician’s duty to preserve these for others [59, 85]. The delicate task of balancing quality and cost can tilt toward the economic considerations, especially in the era of managed care [24, 86].

**The role of the infectious diseases consultant.** The role of infectious diseases consultation is to aid the treating physician in the diagnosis and treatment of infectious diseases [87]. Too often, the consultant is not adequately involved in the ethical deliberations, because he or she feels that, in any event, the primary physician is the one who makes the eventual decision. Although the latter is usually closer to the patient and family and, thus, is able to communicate better with them, we believe that the consultant, who is usually a highly experienced clinician, should often take an active part in ethical considerations.

For example, Emanuel and Richter [88] discuss the relationships between the primary physician, the consultant, and the patient; they suggest a trilateral deliberative model in which there is direct communication between the consultant and patient (or proxy). Indeed, it has been suggested that principles designed for the geriatric population, including ethical issues and the different goals of care in the elderly population, should be integrated into the training and continuing education in infectious diseases [89].

**CONCLUSION**

Given the above, we would offer some recommendations for dealing with difficult ethical decisions regarding antimicrobial therapy for elderly individuals: (1) An attempt should be made to frame the dilemma within the ethical principles of autonomy, beneficence and nonmaleficence, and justice. (2) The consideration of futility of therapy, cost-effectiveness, and possible implications to public health should be weighed. (3) In the relevant clinical situation, and in situations in which the danger of rare complications is irrelevant, consideration may be given to the use of "obsolete" antibiotics, such as chloramphenicol. This drug has an excellent bioavailability profile and covers many gram-positive and gram-negative bacteria and anaerobes [90–92]. In addition, it is a remarkably inexpensive drug. (4) When possible, the infectious diseases consultant should involve him- or herself in those deliberations, despite the fact that those issues are usually considered to be in the domain of the primary care physician. (5) Although, occasionally, patients, families, and physicians may choose to administer antibiotics even to terminally ill patients, logic suggests that the ethical approach to antibiotic administration should be similar to that of other life-sustaining treatments, such as mechanical ventilation.

**Acknowledgment**

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**References**

12. Fins JJ, Miller FG, Acres CA, et al. End of...


