Antibiotic Policies and Utilization in Hospice Care

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Disclosures

• Research funding
  – Cubist Pharmaceuticals
  – Cambia Health Foundation
  – Agency for Healthcare Research and Quality (AHRQ)
  – Palliative Care Research Cooperative Group (PCRC)
A 90-year old man with gangrenous feet

- A 90 plus year old immigrant was brought to the United States from his native country with the hope that US medical care could help him with his gangrenous feet. He was treated with intravenous antibiotics but the treating team concluded that they were ineffective and they were discontinued. The patient and his family were encouraged to return home with hospice care rather than undertaking a high-risk surgery (amputation). While in hospice care he developed *C. difficile* diarrhea which caused fecal incontinence and explosive watery diarrhea. Overwhelmed and angry they returned to the hospital and demanded that surgery be tried. The patient coded on the operating table during the procedure and died in the intensive care unit shortly afterwards.
A 57-year old man with sarcoma invading his lumbosacral plexus

- A 57-year old man with sarcoma invading his lumbosacral plexus had been having progressively worsening pain and complications requiring emergency department (ED) visits and hospitalizations. He had a neurogenic bladder and developed confusion and foul smelling urine thought to be related to urinary tract infection or possibly urosepsis. In discussing with the on-call physician, his wife indicated that she did not want to bring him to the ED but wanted him enrolled in hospice care. They decided to try oral antibiotics with the hope of improving his mental status and preventing imminent death from sepsis. The foul odor resolved and he did not die, however his confusion did not improve. He spent the last 2 weeks of his life in a state of agitated delirium and severe pain that required near palliative-sedation doses of opioids, ketamine, and benzodiazepines to control. In retrospect, the possibility that his infection could be treated but his delirium not resolve wasn’t considered, and dying rapidly of urosepsis may have been preferable.
What happened here?

• Was treatment reasonable?

• Unintended consequences?

• Were these outcomes preventable?
Antibiotics as model for complex decisions at end-of-life
Outline

• Describe of the complex issues and current evidence regarding antibiotic use in hospice care

• Describe the results of a statewide survey on antibiotic policies and utilization in Oregon hospice programs

• Propose and discuss the development of a research network to support hospice research and ultimately improve evidence-based practice
Background

• Infection is common and often the ultimate cause of death among hospice patients

• Little is known regarding the frequency, benefits and burdens of antibiotics in hospice care

• Little is known regarding how antibiotics are used
  – Intent of hospice providers
  – Preferences of hospice patients and families
Infection in hospice care

• 2007 National Home and Hospice Care Survey

• Nationally-representative sample of hospice patients

• Medical record review and ICD-9 codes on discharge to define infections
Infections in hospice

![Bar chart showing infection rates in different settings.](image-url)

*Estimate does not meet standards of reliability or precision because of small cell size.*

<table>
<thead>
<tr>
<th>Infection</th>
<th>Nursing Home</th>
<th>Home Health</th>
<th>Hospice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urinary tract infection</td>
<td>5.2%</td>
<td>3.6%</td>
<td>3.0%</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>2.2%</td>
<td>2.4%</td>
<td>4.4%</td>
</tr>
<tr>
<td>Cellulitis</td>
<td>1.6%</td>
<td>2.0%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Other</td>
<td>2.8%</td>
<td>3.5%</td>
<td>2.5%</td>
</tr>
</tbody>
</table>
Infection in Hospice Care

- 102 consecutive patients who died in a tertiary palliative care unit (Australia)
- Prevalence of infection: 36.3%

<table>
<thead>
<tr>
<th>Infection Type</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urinary Tract</td>
<td>42.5</td>
</tr>
<tr>
<td>Respiratory Tract</td>
<td>22.9</td>
</tr>
<tr>
<td>Blood</td>
<td>12.5</td>
</tr>
<tr>
<td>Skin and Soft Tissue</td>
<td>12.5</td>
</tr>
<tr>
<td>Eyes</td>
<td>10.0</td>
</tr>
</tbody>
</table>

Prevalence of Antibiotic Use in Hospice Care

Original Article

A Nationwide Analysis of Antibiotic Use in Hospice Care in the Final Week of Life

Jennifer S. Albrecht, PhD, Jessina C. McGregor, PhD, Erik K. Fromme, MD, MCR, David T. Bearden, PharmD, and Jon P. Furuno, PhD

Department of Epidemiology and Public Health (J.S.A.), University of Maryland School of Medicine, Baltimore, Maryland; Department of Pharmacy Practice (J.C.M., D.T.B., J.P.F.), Oregon State University/Oregon Health & Science University College of Pharmacy, Portland, Oregon; and Division of Hematology and Medical Oncology (E.K.F.), Knight Cancer Institute and Center for Ethics and Healthcare (E.K.F.), Oregon Health & Science University, Portland, Oregon, USA
Prevalence of Antibiotic Use in Hospice Care

- 2007 National Home and Hospice Care Survey
- 27% of pts received abx in the last 7 days of life
- 1.5% of patients received > 3 antibiotics
- Among patients who received antibiotics, only 9% had a diagnosed infection

Albrecht et al. J Pain Symptom Manage. in press.
Antibiotic use and Infectious Dx

1,028 patients received antibiotics

3,884 hospice discharges

380 patients had an infectious diagnosis

129 patients had both documentation of an infection and received antibiotic

Albrecht et al. J Pain Symptom Manage. in press.
Prevalence of Antibiotic Use on Discharge to Hospice Care

Frequency of Outpatient Antibiotic Prescription on Discharge to Hospice Care

Jon P. Furuno, Brie N. Noble, Kristi N. Horne, Jessina C. McGregor, Miriam R. Elman, David T. Bearden, Eric W. Walsh, Erik K. Fromme

Department of Pharmacy Practice, Oregon State University/Oregon Health & Science University College of Pharmacy, Portland, Oregon, USA; Department of Care Management, Oregon Health & Science University, Portland, Oregon, USA; Department of Family Medicine, Oregon Health & Science University, Portland, Oregon, USA; Palliative Care Service, Oregon Health & Science University, Portland, Oregon, USA; Division of Hematology and Medical Oncology, Knight Cancer Institute, Oregon Health & Science University, Portland, Oregon, USA

Furuno et al., Antimicrob Agents Chemotherapy. 2014
Antibiotic Use on Discharge to Hospice Care

• Cross-sectional study

• Adult inpatients discharged directly from OHSU to hospice care

• January 1, 2010 and December 31, 2012

Furuno et al., Antimicrob Agents Chemotherapy. 2014
Primary Outcome

- Antibiotic prescription on discharge to hospice
- Defined using outpatient medication orders at the time of discharge from the hospital
Documented Infection

- Patients received antibiotics for at least 4 days during the index admission AND

  An infectious diagnosis (ICD-9 code) during the index admission

  OR

  a laboratory-confirmed positive clinical culture during the index admission
Palliative Care Consultation

• Presence of a palliative care consultation note during index admission

• Hypothesis: decreased risk of antibiotic prescriptions on discharge
Results

• 62,792 live adult discharges during the study period, 845 (1.3%) were directly to hospice care.

• 21.7% (183/845) of patients discharged to hospice received a prescription for antibiotics at discharge

• Among pts with a prescription for antibiotics, 27.3% (50/183) did not meet criteria for a documented infection during the index admission
## Infectious Diagnoses

<table>
<thead>
<tr>
<th>Infection</th>
<th>n   (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bloodstream infection, septicemia, or endocarditis</td>
<td>144 (40.0)</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>138 (38.3)</td>
</tr>
<tr>
<td>Urinary Tract Infection</td>
<td>130 (36.1)</td>
</tr>
<tr>
<td>Sepsis</td>
<td>97 (26.9)</td>
</tr>
<tr>
<td>Gastrointestinal tract infections</td>
<td>62 (17.2)</td>
</tr>
<tr>
<td>Pressure Ulcers</td>
<td>51 (14.2)</td>
</tr>
<tr>
<td>Mycoses</td>
<td>38 (10.6)</td>
</tr>
<tr>
<td>Skin and soft tissue infections</td>
<td>28 (7.8)</td>
</tr>
<tr>
<td>Respiratory tract infections</td>
<td>19 (5.3)</td>
</tr>
<tr>
<td>Other</td>
<td>9 (2.5)</td>
</tr>
</tbody>
</table>
Antibiotic Classes Prescribed on Discharge to Hospice (N = 183)

<table>
<thead>
<tr>
<th>Antibiotic Class</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluoroquinolones</td>
<td>64 (35.0)</td>
</tr>
<tr>
<td>Penicillins</td>
<td>39 (21.3)</td>
</tr>
<tr>
<td>Metronidazole</td>
<td>22 (12.0)</td>
</tr>
<tr>
<td>Cephalosporins</td>
<td>19 (10.4)</td>
</tr>
<tr>
<td>Sulfonamides</td>
<td>16 (8.7)</td>
</tr>
<tr>
<td>Glycopeptides</td>
<td>13 (7.1)</td>
</tr>
<tr>
<td>Rifaximin</td>
<td>11 (6.0)</td>
</tr>
<tr>
<td>Topical Agents</td>
<td>11 (6.0)</td>
</tr>
<tr>
<td>Lincosamides</td>
<td>10 (5.5)</td>
</tr>
<tr>
<td>Macrolides</td>
<td>6 (3.3)</td>
</tr>
<tr>
<td>Others</td>
<td>13 (7.1)</td>
</tr>
</tbody>
</table>
Results

• Palliative care consultation was not associated with decreased antibiotic prescriptions (p=0.72)

• Risk factors
  – Cancer diagnosis
  – discharged to home hospice
  – presence of a documented infection
Knowns and Unknowns regarding antibiotic use in hospice care

• Knowns
  – Infection is prevalent in hospice care
  – Antibiotic use is prevalent in hospice care
    • On hospice admission
    • Initiation in hospice care

• Unknowns
  – Benefits (symptom burden, quality of life)
  – Burdens (*C. difficile*, side effects, drug interactions)
  – Preferences (patient, caregiver, provider)
Benefits of Antibiotic Use in Hospice

• Symptom burden

• Quality of life

• Prolonging life
## Infections and Associated Symptoms

<table>
<thead>
<tr>
<th>Infection Site</th>
<th>Associated Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urinary Tract</td>
<td>Dysuria, fever, pain</td>
</tr>
<tr>
<td>Respiratory Tract</td>
<td>Cough, dyspnea, fever, sputum production</td>
</tr>
<tr>
<td>Oral cavity</td>
<td>Fever, mucosal inflammation/pain, odynophagia</td>
</tr>
<tr>
<td>Skin and Soft Tissue Infections</td>
<td>Fever, pain, skin rash/discoloration</td>
</tr>
<tr>
<td>Blood/Bacteremia</td>
<td>Fever, disorientation, hypotension</td>
</tr>
</tbody>
</table>

Reinbolt et al., J Pain Symptom Manage. 2005
Antibiotics and Symptom Improvement

• Systematic review of antimicrobial use in hospice and palliative care

• Articles published 2001-2011

• Most benefit was observed for urinary tract infections (60% to 92%)

Antibiotics and Symptom Improvement

- 1,598 patients with a cancer admitted to a community-based outpatient hospice program

- Infection defined as presence of physical signs and symptoms interpreted by attending physician to have been caused by a microbial agent

- Symptom improvement defined as clinical improvement in one or more symptoms with 72 hours of initiation of therapy

Reinbolt et al., J Pain Symptom Manage. 2005
Antibiotics and Symptom Improvement

• 39% of patients had at least one infection

<table>
<thead>
<tr>
<th>Infection Site (n)</th>
<th>Symptom Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urinary Tract (265)</td>
<td>79%</td>
</tr>
<tr>
<td>Respiratory Tract (221)</td>
<td>43%</td>
</tr>
<tr>
<td>Oral cavity (63)</td>
<td>46%</td>
</tr>
<tr>
<td>Skin and Soft Tissue Infections (59)</td>
<td>41%</td>
</tr>
<tr>
<td>Blood/Bacteremia (25)</td>
<td>0</td>
</tr>
</tbody>
</table>

Reinbolt et al., J Pain Symptom Manage. 2005
Antibiotics and Symptom Improvement

• 102 consecutive patients who died in a tertiary palliative care unit (Australia)

• “Antibiotic response” determined from notes as “amelioration of symptoms”

• Estimated 40% efficacy of antibiotics on symptoms

Potential Burdens of Antibiotic Use in Hospice Care

- Prolonging life
- Drug side effects
- Necessitating use of invasive devices
- Delay transition to hospice or home
- Increase medical costs
- Increase antibiotic selective pressure

Ford et al., Bioethics. 2005
Potential Burdens of Antibiotic Use in Hospice Care

- No data on antibiotic-associated adverse events
  - Side effects
  - Drug-drug interactions
  - Incidence of *Clostridium difficile* infection
    - Bacterial infection resulting in terrible diarrhea
    - Often fatal in severely immunocompromised patients
Antibiotic-associated Adverse Events

• Side effects
  – GI symptoms (nausea, vomiting)
  – Anaphylaxis
  – Skin reactions

• Drug-Drug Interactions
  – Methadone
  – Anticoagulation therapy
Preferences for Antibiotic Use at End of Life

• Providers

• Patients

• Families, loved ones, caregivers
Patient Preferences for Antibiotic Use

• 309 patients with a cancer admitted to a community-based outpatient hospice program

• 54 (18%) patients excluded because already taking antimicrobials

• Surveyed regarding antimicrobial use preferences
  – Use for all suspected and confirmed infections
  – Use only for symptom relief
  – No use

White et al. J Pain Symptom Manage. 2003
### Patient Preferences and Actual Antibiotic Use

<table>
<thead>
<tr>
<th>Treatment Options</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full use</td>
<td>53 (21%)</td>
</tr>
<tr>
<td>Symptoms only</td>
<td>123 (48%)</td>
</tr>
<tr>
<td>No use</td>
<td>79 (31%)</td>
</tr>
</tbody>
</table>
Results: Incidence of Infections

- 117 patients (52%) had 129 infections

<table>
<thead>
<tr>
<th>Infection Site (n)</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urinary Tract</td>
<td>54 (42%)</td>
</tr>
<tr>
<td>Respiratory Tract</td>
<td>45 (35%)</td>
</tr>
<tr>
<td>Oral Cavity</td>
<td>13 (10%)</td>
</tr>
<tr>
<td>Skin and Soft Tissue Infections</td>
<td>12 (10%)</td>
</tr>
<tr>
<td>Blood/Bacteremia</td>
<td>5 (4%)</td>
</tr>
</tbody>
</table>

White et al. J Pain Symptom Manage. 2003
## Patient Preferences and Actual Antibiotic Use

<table>
<thead>
<tr>
<th>Treatment Options</th>
<th>n (%)</th>
<th>Actual Antimicrobial Use, n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full use</td>
<td>53 (21%)</td>
<td>30 (57%)</td>
</tr>
<tr>
<td>Symptoms only</td>
<td>123 (48%)</td>
<td>45 (37%)</td>
</tr>
<tr>
<td>No use</td>
<td>79 (31%)</td>
<td>2 (3%)</td>
</tr>
</tbody>
</table>

White et al. J Pain Symptom Manage. 2003
Rationale for Antibiotic Preferences

• Primary rationale for “full use” was to prolong life as well as treat symptoms

• Primary rationale for “no use” were:
  – no desire to prolong life due to poor condition
  – NPO and did not want IV
  – no desire for additional interventions
Antibiotics on the POLST form

- 870 nursing facility residents
- Assessed consistency of preferences on POLST to actual orders

- “No use”: 32% still received antibiotics
- “Limited use”: 30% received antibiotics

Hickman. J Am Geriatric Soc. 2011
Provider Preferences on Antibiotic Use

• Qualitative study of nurses and medical directors at two Portland-area hospices

• Better understand context for decision to use/not use antibiotics in hospice care
Provider Preferences on Antibiotic Use

• 10 interviews thus far
• 9 nurses and one medical director

• “Uncertainty” regarding when to use antibiotics

• “Bad experiences” when antibiotics had harmful effects on patients in their care
Provider Preferences on Antibiotic Use

• Respecting “patient preferences” and “quality of life” important for antibiotic decisions

• Neither “probability of symptom improvement” nor “costs to either patient or hospices” were important factors
Conclusions

• Antibiotic use is prevalent in hospice care
  – Also prevalent on discharge from acute care to hospice care

• Still have a poor understanding for why patients receive antibiotics and how well they work
Policies and Utilization of Antibiotics in Oregon Hospice Programs
Study Design

• Cross-sectional survey on policies and utilization of antibiotics in Oregon hospice programs
  – OHA member
  – Geographically located in Oregon

• Emailed to the hospice administrator using REDCap (Research Electronic Data Capture)
Survey Design

• Voluntary

• Self-administered

• Completed by the hospice administrator or person most knowledgeable about antibiotic use in the hospice program

• Opportunity to receive a free book on completion of survey
Survey Questions

• Hospice demographics (e.g. profit status, census)
• Presence and content of policies for antibiotic use
• Factors that affect antibiotic utilization
• Collection and submission of POLST forms
• Infections of greatest concern
• Frequency of antibiotic-associated adverse effects
Question Responses

• Estimated numerical frequencies
• Likert scale
  – Never
  – Rarely
  – Sometimes
  – Often
  – Always
Results

• 50 hospice programs were emailed survey

• 78% (n=39) of hospice programs completed at least part of the survey
### Characteristics of Participating Hospice Programs

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Job title</strong></td>
<td></td>
</tr>
<tr>
<td>Medical Director</td>
<td>2 (5.1)</td>
</tr>
<tr>
<td>Executive Director</td>
<td>16 (41.0)</td>
</tr>
<tr>
<td>Nurse Manager</td>
<td>17 (43.6)</td>
</tr>
<tr>
<td>Other</td>
<td>4 (10.3)</td>
</tr>
<tr>
<td><strong>Profit Status (non-profit)</strong></td>
<td></td>
</tr>
<tr>
<td>29 (74.4)</td>
<td></td>
</tr>
<tr>
<td><strong>Population served</strong></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>5 (12.8)</td>
</tr>
<tr>
<td>Rural</td>
<td>15 (38.5)</td>
</tr>
<tr>
<td>Both</td>
<td>19 (48.7)</td>
</tr>
</tbody>
</table>
Characteristics of Participating Hospice Programs (2)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Average Daily Census</strong></td>
<td></td>
</tr>
<tr>
<td>&lt;25</td>
<td>13 (33.3)</td>
</tr>
<tr>
<td>25-50</td>
<td>8 (20.5)</td>
</tr>
<tr>
<td>51-75</td>
<td>9 (23.1)</td>
</tr>
<tr>
<td>&gt;75</td>
<td>9 (23.1)</td>
</tr>
<tr>
<td><strong>Patients receiving home hospice care</strong></td>
<td></td>
</tr>
<tr>
<td>&lt;25</td>
<td>4 (10.3)</td>
</tr>
<tr>
<td>25-50</td>
<td>4 (10.3)</td>
</tr>
<tr>
<td>51-75</td>
<td>11 (28.2)</td>
</tr>
<tr>
<td>&gt;75</td>
<td>20 (51.3)</td>
</tr>
</tbody>
</table>
## Policies for antibiotic use in Oregon hospice programs (n=39)

<table>
<thead>
<tr>
<th>Policy</th>
<th>n</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy regarding antibiotic use for the management of infections†</td>
<td>11</td>
<td>31.4</td>
</tr>
<tr>
<td>Policy regarding the discontinuation of antibiotics‡</td>
<td>6</td>
<td>16.7</td>
</tr>
<tr>
<td>Preferred antibiotics on formulary</td>
<td>27</td>
<td>69.2</td>
</tr>
<tr>
<td>Policies for identifying and managing drug interactions*</td>
<td>36</td>
<td>94.7</td>
</tr>
<tr>
<td>Proportion of medication decisions on which a pharmacist is consulted; median (IQR)</td>
<td>60</td>
<td>35-85</td>
</tr>
</tbody>
</table>

*n = 38, †n = 35, ‡n =36
# Frequency of antibiotic utilization in Oregon hospice programs (n=36)

<table>
<thead>
<tr>
<th>Description</th>
<th>Median % (IQR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients receiving antibiotics on hospice enrollment</td>
<td>12.5 (12-20)</td>
</tr>
<tr>
<td>Patients who have antibiotics discontinued once admitted</td>
<td>5.0 (0-20)</td>
</tr>
<tr>
<td>Patients currently taking antibiotics</td>
<td>10.0 (3.5-20)</td>
</tr>
<tr>
<td>Patients receiving prophylactic antibiotics</td>
<td>2.0 (0-5)</td>
</tr>
<tr>
<td>Antibiotics used to treat urinary tract infections*</td>
<td>75 (52.0-85.0)</td>
</tr>
<tr>
<td>Antibiotics used to treat pneumonia†</td>
<td>18.5 (7.5-54.5)</td>
</tr>
<tr>
<td>Antibiotics used to treat COPD exacerbations*</td>
<td>10 (4-26)</td>
</tr>
<tr>
<td>Antibiotics used to treat skin and soft tissue infections‡</td>
<td>25 (10-50)</td>
</tr>
</tbody>
</table>

* n = 33, † n = 32, ‡ n = 34
# Rationale for antibiotic use in Oregon hospice programs (n = 37)

<table>
<thead>
<tr>
<th>Rationale</th>
<th>Never n (%)</th>
<th>Rarely n (%)</th>
<th>Sometimes n (%)</th>
<th>Often n (%)</th>
<th>Always n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Document rationale for antibiotic use</td>
<td>--</td>
<td>1 (2.7)</td>
<td>3 (8.1)</td>
<td>17 (46.0)</td>
<td>16 (43.2)</td>
</tr>
<tr>
<td>Antibiotics used to treat symptoms</td>
<td>--</td>
<td>3 (8.1)</td>
<td>3 (8.1)</td>
<td>15 (40.5)</td>
<td>16 (43.2)</td>
</tr>
<tr>
<td>Antibiotics used to cure infections*</td>
<td>3 (8.3)</td>
<td>3 (8.3)</td>
<td>15 (41.7)</td>
<td>12 (33.3)</td>
<td>3 (8.3)</td>
</tr>
<tr>
<td>Antibiotics used to prolong life*</td>
<td>9 (25.0)</td>
<td>22 (61.1)</td>
<td>5 (13.9)</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Antibiotics not used because risks outweigh potential benefits†</td>
<td>--</td>
<td>7 (20.0)</td>
<td>18 (15.4)</td>
<td>10 (28.6)</td>
<td>--</td>
</tr>
</tbody>
</table>

*n= 36, †n = 35

41.6%
Subjective frequency of antibiotic related adverse events (n = 37)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Never n (%)</th>
<th>Rarely n (%)</th>
<th>Sometimes n (%)</th>
<th>Often n (%)</th>
<th>Always n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin reaction*</td>
<td>4 (11.1)</td>
<td>20 (55.6)</td>
<td>12 (33.3)</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Anaphylaxis*</td>
<td>31 (86.1)</td>
<td>5 (13.9)</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>1 (2.7)</td>
<td>13 (35.1)</td>
<td>18 (48.7)</td>
<td>5 (13.5)</td>
<td>--</td>
</tr>
<tr>
<td>Clostridium difficile infection†</td>
<td>11 (31.4)</td>
<td>19 (54.3)</td>
<td>5 (14.3)</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Nausea/vomiting*</td>
<td>3 (8.4)</td>
<td>16 (44.4)</td>
<td>13 (36.1)</td>
<td>4 (11.1)</td>
<td>--</td>
</tr>
<tr>
<td>Headache*</td>
<td>10 (27.8)</td>
<td>19 (52.8)</td>
<td>7 (19.4)</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Yeast infections</td>
<td>3 (8.1)</td>
<td>11 (29.7)</td>
<td>15 (40.5)</td>
<td>8 (21.6)</td>
<td>--</td>
</tr>
<tr>
<td>Stevens-Johnson syndrome‡</td>
<td>29 (85.3)</td>
<td>5 (14.7)</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

*n = 36, †n = 35, ‡n = 34
### Infections of Concern (n=37)

<table>
<thead>
<tr>
<th>Infection type</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urinary tract infections</td>
<td>35 (89.7)</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>15 (38.5)</td>
</tr>
<tr>
<td><em>Clostridium difficile</em></td>
<td>14 (35.9)</td>
</tr>
<tr>
<td>Skin and soft tissue infections</td>
<td>11 (28.1)</td>
</tr>
<tr>
<td>COPD exacerbations</td>
<td>6 (15.4)</td>
</tr>
<tr>
<td>Norovirus</td>
<td>2 (5.1)</td>
</tr>
<tr>
<td>Other</td>
<td>3 (7.7)</td>
</tr>
</tbody>
</table>
Conclusions

• 39/50 (78%) of hospice programs completed the survey

• 31% of hospice programs had a policy for whether or not to use antibiotics in their patients

• > 50% of respondents reported that diarrhea and yeast infections at least sometimes occurred in patients on antibiotics
Oregon Hospice Research Network
Mission (work in progress)

• To support hospice research and improve evidence-based practice for the betterment of hospice patients and their families in Oregon and beyond
Practice-Based Research Network?

• Group of primary care clinicians and practices working together to answer community-based health care questions and translate research findings into practice

• PBRNs engage clinicians in quality improvement activities and an evidence-based culture in primary care practice to improve the health of all Americans

Practice-Based Research Networks (PBRNs)

PBRNs are groups of primary care clinicians and practices working together to answer community-based health care questions and translate research findings into practice. PBRNs engage clinicians in quality improvement activities and an evidence-based culture of primary care practice to improve the health of all Americans.

AHRQ invites all interested primary care networks to register with the AHRQ PBRN Resource Center (PBRN RC). The PBRN RC provides resources and assistance to Primary Care PBRNs engaged in clinical and health services research. The PBRN RC provides support to registered PBRNs through various methods including a series of web-based seminars and offering technical assistance in research methodology and PBRN organization and development. Click here to access the PBRN Registry.

PBRN Listserv: Join the Conversation among Practice-Based Research Networks!
PBRNs in End-of-Life Research

The Practice-Based Research Network as a Model for End-of-Life Care Research: Challenges and Opportunities

Jean S. Kutner, MD, MSPH, Deborah S. Main, PhD, John M. Westfall, MD, MPH, and Wilson Pace, MD
PBRNs in End-of-Life Research

• Population-Based Palliative Care Research Network (PoPCRN)
• Jean Kutner and David Nowels

• “A lack of empiric evidence regarding care of terminally-ill persons in the community-based settings where the care is provided.”

Kutner et al. Cancer Control. 2005
PBRNs in End-of-Life Research

• Group of clinicians, practices, or institutions that are devoted primarily to the delivery of patient care and are affiliated with each other to investigate questions related to community-based practice

• Ongoing commitment to research
• Organizational structure that transcends a single study
• Clinicians/administrators must actively participate in the research

Kutner et al. Cancer Control. 2005
Examples of PoPCRN Research Studies

- Symptom prevalence and distress
- Psychosocial/spiritual issues
- Bereavement
- Confusion/delirium
- Discharge follow-up
- Symptoms/quality of life
- Falls
- Education
- Massage therapy
- Heart failure
- Pharmacy costs
One Year Goals

• Goal 1: Establish Infrastructure

• Goal 2: Develop a patient and caregiver interest group

• Goal 3: Perform two surveys within the network
  – Hospice providers (RN, MD, SW, admin)
  – Patients, families, and caregivers
Goal 1: Infrastructure

• Identify interested partners

• Contact person(s)

• Characteristics of hospice program
  – Average daily census
  – Population served
  – Charting methods
Infrastructure: Recommended Key Roles

- Network Director
- Research Director
- Communications activities
- Research Coordination
- Statistical Consultant
- Information Systems Support
Goal 2

- Develop a patient and caregiver interest group

- Patients/caregivers should be active participants in design and conduct of hospice PBRN research
  - Which research questions we ask
  - How we try and answer them
  - What we do with the information
Goal 3: Two Surveys

- Hospice providers
- Patients/caregivers
- Address questions raised by participating hospice programs
Survey/Study Ideas

• Medication decision-making
  – Antibiotics
  – Anticoagulation therapy

• Safety and efficacy of medications in hospice

• Transitions of care from acute to hospice care
Benefits of Participating

• Address research questions directly applicable to the care you are providing

• Expert guidance on current practice and implementation and evaluation of interventions

• Authorship on presentations and publications

• Involvement with the PCRC
PCRC

• Palliative Care Research Cooperative Group

• Funded by National Institutes of Health

• To advance evidence and quality of palliative care and end-of-life research

http://www.palliativecareresearch.org
Current PCRC Studies

- Statin discontinuation
- Pharmacovigilence
- Supportive Care
- QDACT
Summary

- Antibiotic use is prevalent in hospice care despite a lack of evidence to guide its use.

- Multiple opportunities exist to improve antibiotic use and potentially patient outcomes in hospice care.
Summary

• Working together, we can further develop the evidence base to inform hospice decisions regarding treatments and practices most important to hospice providers and their patients
Final Thoughts

• Pneumonia is an ‘old man’s friend’...

– Sir William Osler
Final Thoughts

• “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”

— Sir William Osler
Acknowledgements

• OSU College of Pharmacy
  – David Bearden
  – Miriam Elman
  – David Lee
  – Jessina McGregor
  – Rachel Novak
  – Michael Tice

• University of Maryland
  – Jennifer Albrecht
  – Angela Comer
  – Joseph Rosenberg
  – Mary Lynn McPherson

• OHA
  – Deborah Whiting Jaques

• OHSU
  – Erik Fromme
  – Kristi Horne
  – Seiko Izumi
  – Christina Kowalewska
  – Eric Walsh

• University of Colorado
  – Jean Kutner
Questions?

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