Clinical Course of Advanced Dementia: Complications, Interventions, and Decision-Making

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Disclosure

- Faculty: Susan L Mitchell MD, MPH

- Relationships with commercial interests:*
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  - Consulting Fees: NONE
  - Other: NONE
Goals

- Describe clinical course of advanced dementia
- Present most common complications
- Outline an approach to decision-making
Epidemiology

- Over 5.2 million Americans have Alzheimer’s disease and other dementias 16 million by 2030
- 5th leading cause of death among those > 65 in US in 2010
Change in Number of Deaths Between 2000 and 2010

- Breast Cancer: -2%
- Prostate Cancer: -8%
- Heart Disease: -16%
- Stroke: -23%
- HIV: -42%
- Alzheimer's Disease: +68%

Alz Assn Facts and Figures 2013
Under-reporting of dementia on death certificates

Wachterman et al, JAMA 2009

- Immediate (16%)
- Underlying (35%)
- Contributing (16%)
- Not mentioned (37%)

James et al., Neurology 2014
- 2010 reported vs. estimated deaths: ~84,000 vs. 500,000
Location of Death

Mitchell SL et al. JAGS 2005
Advanced Dementia

Global Deterioration Scale Stage 7*

- Do not recognize family
- Loss of all verbal abilities
- Non-ambulatory
- Incontinent

* Reisberg B, J Psychiatry 1982
Background

• Palliative care sub-optimal:
  – Under-recognition as a terminal condition
  – Prognostication
  – Lack of high quality research
Cancer

Chronic disease
Advanced DEmentia Prognostic Tool

**Goal:** Develop and prospectively validate a 6-month mortality risk score in advanced dementia

**Findings:** ADEPT tool ability to predict 6-month survival is modest: AUROC = 0.68) (vs. hospice eligibility = 0.55)

**Implications:** Access to palliative care should be based on preference not prognosis

*Mitchell SL et al, JAMA 2010*
Clinical Course

- CASCADE: 18 months prospective study
  - 323 patients advanced dementia
  - Mortality rate: 55%
  - Most common complications
    - ~ 90% eating problems
    - ~ 50% recurrent infections/fever
    - Others rare (stroke, fracture, MI)
  - Less aggressive care when families informed
Decision-Making

Proxy’s participated in 126 decisions

- Eating problem (29%)
- Pneumonia (19%)
- Febrile illness (6%)
- Pain Rx (18%)
- Dyspnea Rx (10%)
- Behavior Rx (10%)
- Seizure Rx (6%)
- Other (2%)

Givens JL, JAGS 2009
Decision-Making

• Advance care planning is critical
• Opportunity to discuss early
  – Prepare family for what to expect in advanced stages
  – Elicit wishes
  – Set the stage for future discussions
Steps to Operationalize Decision-Making

1. Clarify clinical situation
2. Determine primary goal of care
3. Present treatment options
4. Weigh options against perceived values
Step 1: Clarify Clinical Situation

• Eating problems
  – Very common in end-stage
  – Last activity of daily living to be lost
Step 2: Goals of Care

- Life prolongation
- Maintain function
- Comfort

Gillick MR, JAMDA 2001
Step 3: Present Options

- Supportive care vs. long-term tube-feeding (PEG or J-tube)
- No RCT!!!
Options: Hand-Feeding

- Provide food and drink to the extent that is enjoyable
- Sub-optimal nutrition in favor of comfort
- Palliative care
- Nutritional supplements can increase weight
Options: Tube-Feeding

• No demonstrable benefits
  – Prevent Aspiration NO
  – Heal Malnutrition/Pressure Ulcers NO
  – Improve Survival NO
  – Promote Comfort NO

• Risks
A 24-month survival comparison of residents with severe cognitive impairment with (dotted line) and without (dashed line) feeding tubes.
Tube-Feeding: Risks

• Relatively safe procedure
• Special considerations
  – Agitation
  – Hospital transfer for complications
  – Pressure ulcers: increased risk and poorer healing
    • Teno et al, Arch Intern Med;2012
## Step 4: Weigh Options

<table>
<thead>
<tr>
<th>Options</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand-feeding</td>
<td>Tastes food</td>
<td>Takes Time</td>
</tr>
<tr>
<td></td>
<td>Social Interaction</td>
<td>Inconsistent Intake</td>
</tr>
<tr>
<td></td>
<td>Focus on comfort</td>
<td></td>
</tr>
<tr>
<td>Tube-feeding</td>
<td>Nutrition delivered</td>
<td>No Clear Benefits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Complications</td>
</tr>
</tbody>
</table>
Step 4: Weigh Options

- Align with goal of care
  - Comfort → Hand-Feeding
  - Prolong life → ???
Step 4: Weigh Options

- Expert opinion and multiple position statements (AGS, AA, AAHPM, Choose Wisely)
  - tube-feeding has no demonstrable benefits and should not be offered
Feeding Insertion Rate in NH residents with Advance Dementia
Infections
Step 1: Clarify Clinical Situation

- Very common in end-stage dementia: ~ 50% last 90 days
- High mortality
- Discomfort:
  - Symptoms
  - Assessment
  - Treatment
Step 2: Goals of Care

- Life prolongation
- Maintain function
- Comfort

Gillick MR, JAMDA 2001
Step 3: Present Options
Antimicrobial Exposure

% residents getting antimicrobial

Days prior to death

* D'Agata EMD, Mitchell SL Arch Int Med 2007
Antimicrobial Resistance

- Nursing home prevalence study (N=84)
  - 64% advanced dementia colonized
  - 3 times higher than other residents
- Nursing home residents bring resistant bacteria into hospitals
- Public health issue

*Pop-Vicas A, J Am Geriatr Soc 2008*
Infection Management

Original Investigation

Infection Management and Multidrug-Resistant Organisms in Nursing Home Residents With Advanced Dementia

• Study of Pathogen Resistance and Exposure to Antimicrobials in Dementia
• 362 NH residents with advanced dementia
• 12 months follow-up
• Outcomes
  – Antimicrobial use
  – Multi-drug resistant organisms (MDRO)
**Antimicrobial use**

**Development of Minimum Criteria for the Initiation of Antibiotics in Residents of Long-Term–Care Facilities: Results of a Consensus Conference**

<table>
<thead>
<tr>
<th>TABLE 3. Minimal Criteria for Initiation of Empiric Antimicrobial Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Respiratory Tract</strong></td>
</tr>
<tr>
<td><strong>a. Temperature &gt;38.9°C</strong> &gt; 1 of following:</td>
</tr>
<tr>
<td>1. Respiratory rate &gt; 25 breaths/minute</td>
</tr>
<tr>
<td>2. New productive cough</td>
</tr>
<tr>
<td><strong>b. Temperature &gt;37.9°C (&lt;38.9°C)</strong></td>
</tr>
<tr>
<td>New productive cough AND ≥ 1 of the following:</td>
</tr>
<tr>
<td>1. Pulse &gt; 100 beats/minute</td>
</tr>
<tr>
<td>2. Respiratory rate &gt; 25 breaths/minute</td>
</tr>
<tr>
<td>3. Rigors</td>
</tr>
<tr>
<td>4. Change in mental status¹</td>
</tr>
<tr>
<td><strong>c. Aerobic with COPD</strong></td>
</tr>
<tr>
<td>New increased cough with purulent sputum</td>
</tr>
<tr>
<td><strong>d. Aerobic without COPD</strong></td>
</tr>
<tr>
<td>New productive cough AND &gt; 1 of the following:</td>
</tr>
<tr>
<td>1. Respiratory rate &gt; 25 breaths/minute</td>
</tr>
<tr>
<td>2. Change in mental status¹</td>
</tr>
</tbody>
</table>

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1. Diagnostic criteria for delirium can be difficult to evaluate in advanced dementia, therefore any change from baseline mental status will be considered.

2. Urgency, frequency, skin tenderness, costovertebral tenderness and suprapubic pain may be difficult to evaluate in advanced dementia but will be acceptable criteria if present.

3. Unstable vital signs = systolic blood pressure < 90 mmHg systolic OR heart rate ≥ 100 beats/minute OR respiratory rate ≥ 25 breaths/minute.
## SPREAD: Rx of Episodes

<table>
<thead>
<tr>
<th>Source of suspected infectious episodes</th>
<th>All</th>
<th>LRI</th>
<th>UTI</th>
<th>Skin</th>
<th>Fever only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Episodes, No.</td>
<td>486</td>
<td>144</td>
<td>193</td>
<td>68</td>
<td>81</td>
</tr>
<tr>
<td>Treated with antimicrobials, No. (%)</td>
<td>354</td>
<td>103</td>
<td>145</td>
<td>65</td>
<td>41</td>
</tr>
<tr>
<td>Minimal criteria met, No. (%)</td>
<td>157</td>
<td>35</td>
<td>28</td>
<td>62</td>
<td>32</td>
</tr>
</tbody>
</table>

Note: Numbers in parentheses indicate percentage.
## SPREAD: MDRO

<table>
<thead>
<tr>
<th></th>
<th>Months from Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td><strong>Cumulative Incidence (%)</strong></td>
<td></td>
</tr>
<tr>
<td>Any MDRO</td>
<td>0</td>
</tr>
<tr>
<td>MDRGN</td>
<td>0</td>
</tr>
<tr>
<td>MRSA</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No. at Risk</th>
<th>0</th>
<th>3</th>
<th>6</th>
<th>9</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any MDRO</td>
<td>175</td>
<td>116</td>
<td>93</td>
<td>71</td>
<td>61</td>
</tr>
<tr>
<td>MDRGN</td>
<td>200</td>
<td>145</td>
<td>124</td>
<td>93</td>
<td>85</td>
</tr>
<tr>
<td>MRSA</td>
<td>278</td>
<td>218</td>
<td>184</td>
<td>160</td>
<td>151</td>
</tr>
</tbody>
</table>
## MDRO Acquisition

### Association antimicrobial use and acquisition of any MDRO‡

<table>
<thead>
<tr>
<th></th>
<th>Adjusted Hazard Ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quinolones</strong></td>
<td></td>
</tr>
<tr>
<td>Any use§</td>
<td>1.89 (1.28, 2.81)</td>
</tr>
<tr>
<td>Days of therapy/1000 resident-days (log)</td>
<td>1.18 (1.06, 1.32)</td>
</tr>
<tr>
<td><strong>Third/fourth generation cephalosporins</strong></td>
<td></td>
</tr>
<tr>
<td>Any use</td>
<td>1.57 (1.03, 2.40)</td>
</tr>
<tr>
<td>Days of therapy/1000 resident-days (log)</td>
<td>1.16 (1.00, 1.35)</td>
</tr>
</tbody>
</table>
Pneumonia: survival

Survival after pneumonia episodes

*Adjusted for age, gender, race, functional status, suspected aspiration, congestive heart failure, hospice referral, do-not-hospitalize order, and chest x-ray having been obtained.

*Givens JL Arch Int Med 2010
Suspected UTIs: Survival

Survival after suspected UTIs: no antimicrobials (blue), oral (red), IM (green), and IV antimicrobials or hospitalization (brown).
Pneumonia: Comfort

*Symptom Management at the End-of-Life in Dementia, range=0-45, higher score means more comfort

Mean SM_EOLD*

Antibiotic treatment

None | Oral | IM | IV or hospital

P$_{\text{trend}}$ = 0.01
## SPREAD: Interventions for Suspected Infections

<table>
<thead>
<tr>
<th>Suspected Source</th>
<th>No. of Episodes</th>
<th>Hospital Transfers</th>
<th>Chest X-Rays</th>
<th>Blood Draws</th>
<th>Urine Samples</th>
<th>At least one</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory Tract</td>
<td>148</td>
<td>11%</td>
<td>59%</td>
<td>47%</td>
<td>--</td>
<td>68%</td>
</tr>
<tr>
<td>Urinary Tract</td>
<td>196</td>
<td>9%</td>
<td>--</td>
<td>43%</td>
<td>94%</td>
<td>96%</td>
</tr>
<tr>
<td>Skin/Soft Tissue</td>
<td>69</td>
<td>6%</td>
<td>--</td>
<td>23%</td>
<td>--</td>
<td>25%</td>
</tr>
<tr>
<td>Fever</td>
<td>83</td>
<td>17%</td>
<td>40%</td>
<td>54%</td>
<td>46%</td>
<td>66%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>496</strong></td>
<td><strong>10%</strong></td>
<td><strong>24%</strong></td>
<td><strong>43%</strong></td>
<td><strong>45%</strong></td>
<td><strong>73%</strong></td>
</tr>
</tbody>
</table>
Suspected UTIs

• Diagnosis
  – What is symptomatic?
  – Urine almost always positive

• Work up uncomfortable

• Extensive antimicrobial (mis)use
  – Often not true bacterial infection
  – Does not extend life
  – ? comfort
### Step 4: Weigh Options

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<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>No antibiotics/</td>
<td>Greater Comfort</td>
<td>Survival ?</td>
</tr>
<tr>
<td>palliation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antibiotics</td>
<td>Survival ?</td>
<td>Greater Discomfort</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cost Antimicrobial Resistance</td>
</tr>
</tbody>
</table>
Step 4: Weigh Options

- Align with goal of care
  - Comfort → Palliation only
  - Prolong life → Antimicrobials
    - Pneumonia
      - probably
      - oral may be adequate
    - Suspected UTI
      - probably not
Decision to Hospitalize

• What is the goal of care?
  – Survival ↔ Comfort
  – 95% of proxies state comfort

• Does hospitalization meet that goal?
# CASCADE: Hospital Transfers

<table>
<thead>
<tr>
<th>Admissions (N=74)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infections</td>
<td>59</td>
</tr>
<tr>
<td>GI Bleed</td>
<td>8</td>
</tr>
<tr>
<td>Dyspnea</td>
<td>7</td>
</tr>
<tr>
<td>Fracture</td>
<td>5</td>
</tr>
<tr>
<td>Heart Failure</td>
<td>3</td>
</tr>
<tr>
<td>Dehydration</td>
<td>3</td>
</tr>
<tr>
<td>Feeding Tube Cx</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ER Visits (N=60)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feeding Tube Cx</td>
<td>47</td>
</tr>
<tr>
<td>Infection</td>
<td>27</td>
</tr>
<tr>
<td>Fall</td>
<td>15</td>
</tr>
<tr>
<td>Fracture</td>
<td>3</td>
</tr>
<tr>
<td>Mental Status Change</td>
<td>2</td>
</tr>
<tr>
<td>Chest Pain</td>
<td>2</td>
</tr>
<tr>
<td>IV insertion</td>
<td>2</td>
</tr>
<tr>
<td>Jaundice</td>
<td>2</td>
</tr>
</tbody>
</table>
Hospital Transfers

• Most (> 75%) hospital transfers of NH advanced dementia are avoidable...

  Managed same efficacy in nursing home
  OR
  Not consistent with goal of care/preferences
Summary

- Dementia is terminal illness
- Feeding problems and infections are most common complications and decisions
- Aggressive interventions are less likely when families have a better understanding of prognosis and expected complications
Summary

- Ethical decision-making
  - informed, guided by the goals of care
- Tube-feeding has no demonstrable benefits and should not be offered
- Suspected infections
  - Antimicrobial overuse
  - Evidence of bacterial infection often absent
  - Antimicrobial for pneumonia may prolong life but also cause more discomfort
  - Suspected UTIs-no survival benefit
- Most hospitalizations avoidable
Take home points

• Opportunity for advance care planning
• Focus on goals of care
• Do not feel compelled to offer everything
• Be knowledgeable about the best evidence
• Use decision support tools/geriatric consults/team
Key Opportunities

• **ACP**
  - When and how?

• **Ensure access to high quality palliative care**
  - Integrate into primary care, consultation
  - Train workforce
  - Align fiscal and care incentives
  - Develop validate metrics
# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is Advanced Dementia?</td>
<td>6</td>
</tr>
<tr>
<td>Determining the Primary Goal of Care</td>
<td>8</td>
</tr>
<tr>
<td>Basic Approach to Decision-Making</td>
<td>11</td>
</tr>
<tr>
<td>Approach to Eating Problems</td>
<td>17</td>
</tr>
<tr>
<td>Approach to Decisions about Hospitalization</td>
<td>23</td>
</tr>
<tr>
<td>Approach to Treatment Decisions for of Infections</td>
<td>26</td>
</tr>
<tr>
<td>How Advanced Dementia Affects the Family</td>
<td>30</td>
</tr>
<tr>
<td>What is Hospice and Palliative Care?</td>
<td>34</td>
</tr>
<tr>
<td>Glossary</td>
<td>37</td>
</tr>
<tr>
<td>Resources</td>
<td>41</td>
</tr>
</tbody>
</table>