Does improving end-of-life cancer care require reforming clinical care or system capacity?

Hospital-specific analyses from the Dartmouth Atlas of Healthcare Project

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National Institute on Aging
Percent of Decedents Enrolled in Hospice During the Last Six Months of Life by HRR (2001-05)
Want to spend last days in the hospital...?

National random survey of 2,847 community dwelling Medicare beneficiaries > 65 years 2003:

<table>
<thead>
<tr>
<th></th>
<th>Non Hispanic White</th>
<th>Hispanic</th>
<th>Black</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>In a hospital</td>
<td>8.0 (6.8-9.2)</td>
<td>15.2 (9.6-23.4)</td>
<td>17.7 (14.4-21.6)</td>
<td>16.3 (10.1-25.3)</td>
</tr>
<tr>
<td>In a nursing home</td>
<td>5.2 (4.3-6.2)</td>
<td>1.9 (0.5-7.3)</td>
<td>7.7 (5.6-10.6)</td>
<td>4.4 (1.6-11.0)</td>
</tr>
<tr>
<td>At home</td>
<td>86.9 (85.3-88.3)</td>
<td>82.9 (74.4-88.9)</td>
<td>74.6 (70.3-78.4)</td>
<td>79.4 (69.9-86.4)</td>
</tr>
</tbody>
</table>

Percent of Deaths Occurring in Hospital among Chronically Ill Patients by HRR (2001-05)

- 35% to 49% (64)
- 32% to < 35% (52)
- 29% to < 32% (74)
- 26% to < 29% (57)
- 15% to < 26% (59)
- Not Populated
End of Life Cancer Care Research Team

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End of Life Cancer Cohorts

- 2003-07 20% age 66 – 99 who died & had a discharge or 2 clinician visits with diagnosis poor prognosis cancer in last 6 months of life.
- And who were admitted to a hospital in the last year of life.
- Patients assigned to the hospital with the majority of inpatient days.
- Adjusted for age, sex, race, cancer type, mix of other chronic disease, MHHI (ZIP), bed supply (HSA), hospital for profit status.
- Stratified by hospital type: NCI cancer center, AMC, community hospital.
- GENMOD multilevel models with patient as the unit of analysis.
Percent dying in hospital
NCI Cancer Centers and Academic Medical Centers (non-NCI)

Westchester Medical Center 57.1
New York Methodist Hospital 54.9
New York-Presbyterian Hospital 46.2
Robert Wood Johnson Univ, NJ 42.4
Univ of Wisconsin Hosp & Clinics 22.5
Univ of Washington Med Ctr 21.3
St. Joseph’s Med Ctr, Phoenix 18.9
Evanston Northwestern 18.7

Green dots = highest & lowest NCI cancer centers
Red dots = highest & lowest academic medical centers
Hospice days in last month of life
NCI Cancer Centers and Academic Medical Centers (non-NCI)

University Med Ctr-Lubbock 12.5
Univ of Iowa Hosp & Clinics 12.4
MUSC Medical Center 12.0
University of Alabama Hospital 11.5

City of Hope National Med Ctr 6.0
New York-Presbyterian Hospital 3.7
Montefiore Medical Center 3.0
Westchester Medical Center 2.9

Green dots = highest & lowest NCI cancer centers
Red dots = highest & lowest academic medical centers
Hospital days during last month of life
NCI Cancer Centers and Academic Medical Centers (non-NCI)

New York Methodist Hospital 8.4
Westchester Medical Center 8.4
New York-Presbyterian Hospital 7.3
Robert Wood Johnson Univ 6.8
Univ of Washington Med Ctr 3.9
St. Joseph Mercy Hospital 3.9
Univ of Iowa Hosp & Clinics 3.8
Univ of California Davis Med Ctr 3.5

Green dots = highest & lowest NCI cancer centers
Red dots = highest & lowest academic medical centers
ICU days during last month of life
NCI Cancer Centers and Academic Medical Centers (non-NCI)

- Allegheny General Hospital: 4.3
- Cooper Health System: 3.7
- Nebraska Medical Center: 3.1
- UCLA Medical Center: 2.9
- Dartmouth-Hitchcock Med Ctr: 0.7
- Memorial Sloan-Kettering: 0.6
- St. Francis Hospital & Med Ctr: 0.4
- Fletcher Allen Health Care: 0.4

Green dots = highest & lowest NCI cancer centers
Red dots = highest & lowest academic medical centers
Percent receiving chemotherapy during last two weeks of life
NCI Cancer Centers and Academic Medical Centers (non-NCI)

Cedars-Sinai Medical Center 12.3
Lenox Hill Hospital 11.6
Univ of Tennessee Med Ctr 8.3
Robert Wood Johnson Univ 6.9
Carolinas Medical Center 4.7
Hartford Hospital 3.5
UPMC Presbyterian Shadyside 3.3
Memorial Sloan-Kettering 1.4

Green dots = highest & lowest NCI cancer centers
Red dots = highest & lowest academic medical centers
Percent of Patients Seeing 10 or More Different Physicians in the Last 6 Months of Life

NCI Cancer Centers and Academic Medical Centers (non-NCI)

North Shore University Hospital 82.0
Allegheny General Hospital 79.4
Memorial Sloan-Kettering 75.6
MedStar-Georgetown Med Ctr 72.7
University of Alabama Hospital 38.5
Univ of Wisconsin Hosp & Clinics 34.7
University of Kentucky Hospital 33.6
Oklahoma University Med Ctr 26.9

Green dots = highest & lowest NCI cancer centers
Red dots = highest & lowest academic medical centers
End-of-life care may reflect broader problems in health care systems

- Uneven quality.
- An emphasis on subspecialty care, imaging, tests, procedures, with the goal of curing disease.
- An assumption that more care, and more costly is better.
- Care decisions dominated by the values of health care professionals.
- Who is asking and listening about patient and family preferences.
Changing end-of-life care may require macro system reforms

From the SUPPORT study...

• Most patients expressed a preference to die at home.
• Most died in the hospital. Varied across SUPPORT sites: 23-54%.
• Variation was not explained by socio-demographic or clinical characteristics.
• The most powerful predictor of death in a hospital (versus other setting) was area hospital bed supply.

TABLE 4 -- Odds of Death Occurring in the Hospital among SUPPORT Patients Associated with Health System Characteristics of HRR of Residence of Patient

<table>
<thead>
<tr>
<th>Characteristics of HRR of SUPPORT Patient Residence</th>
<th>Adjusted Odds Ratio</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital days per 1000 (per 1000 day increment)</td>
<td>3.32</td>
<td>1.00, 11.1</td>
</tr>
<tr>
<td>% Residing in nursing homes (per increase of 10%)</td>
<td>1.07</td>
<td>0.64, 1.82</td>
</tr>
<tr>
<td>% Medicare HMO enrollment (per increment of 10%)</td>
<td>1.04</td>
<td>0.97, 1.12z</td>
</tr>
<tr>
<td>Medicare expenditures per beneficiary for:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home health (per $100 increment)</td>
<td>0.84</td>
<td>0.58, 1.24</td>
</tr>
<tr>
<td>Hospice (per $100 increment)</td>
<td>0.20</td>
<td>0.05, 0.85</td>
</tr>
<tr>
<td>Skilled nursing (per $100 increment)</td>
<td>0.70</td>
<td>0.21, 2.35</td>
</tr>
<tr>
<td>Primary care MDs per 100,000 (increment of 10)</td>
<td>0.57</td>
<td>0.29, 1.12</td>
</tr>
<tr>
<td>Specialist MDs per 100,000 (increment of 10)</td>
<td>1.31</td>
<td>1.05, 1.65</td>
</tr>
</tbody>
</table>

Does improving end-of-life cancer care require only reforming clinical microsystems or also health care system capacity and organization?