The SOCARE Model of Cancer Care for Older Adults: Building Infrastructure and Policies for Truly Personalized Cancer Care for an Aging Society

William Dale, MD, PhD
Michael M Davis Lecture Series
University of Chicago
Oct 14, 2014
Perspective

• **Internist**: Geriatrician/Palliative Medicine

• **Health Policy PhD**: Medical Decision Making, Behavioral Economics

• **Clinically**: “Embedded” in Oncology

• **Administratively**: Section Chief, Geri/PM
Consider Two Older Adults Diagnosed with Cancer
Two Different Outcomes

Why?
IOM Report: Cancer Care System in Crisis

- 60% of cancer survivors 65+
- Limited evidence on care of older adults with cancer
- “One problem among many”
- Workforce with geriatric training
- Support and training for caregivers

http://jama.jamanetwork.com/article.aspx?articleid=1764058#jvp130139r1
Geriatrics Approach to Cancer Care: Challenges
Why Treating Older Adults is Difficult

- High Prevalence
- Age-Associated Problems
- High Symptom Burdens
- “Evidence-Based Medicine” with Little Evidence
- Clinical Pressures
Emphasis on Evidence

GERIATRIC MEDICINE

3rd Edition

GERIATRIC MEDICINE

4th Edition

An Evidence-Based Approach
Fig 1. Proportion of elderly patients enrolled onto registration trials compared with the proportion of elderly patients in the US cancer population. The differences between the two groups were significant for all age groups ($P < .001$).
Ways of Treating Older Adults with Cancer (Badly)

**Undertreat**: Discriminate against a person based solely on (older) age

**Overtreat**: Making management choices based on mortality alone

**Mistreat**: Non-evidence based, non-preference based decisions
Overtreatment: Prostate Cancer

(A) Prostate Cancers
- Screening
- Control

(B) Prostate-Cancer Deaths
- Screening
- Control
National Failure to Operate on Older Adults

Clinical, pretreatment Stage I
(N = 9,559)

Surgery
2,736 (28.6%)

Pancreatectomy
2,630 (27.5%)

Unresectable
106 (1.1%)

No Surgery
6,823 (71.4%)

Not Offered Surgery
3,644 (38.2%)

Patient Refused
403 (4.2%)

Advanced Age
869 (9.1%)

Comorbidities
616 (6.4%)

Unknown
1,291 (13.5%)

NCDB
Geriatrics Approach to Cancer Care: A Strategy
Strategy for Treating Older Adults with Cancer

• Estimate Remaining Life Expectancy
  • Demographic Profile
  • Geriatric Assessment

• Stage the Aging Along with the Cancer
  • Treat the Cancer as Aggressively as Possible
  • Minimize Toxicities to the Patient
  • Consider Timelines

• Decision Making & Communication
  • Framing
  • Emotions
  • Trust
Life Expectancy and Geriatric Assessment
Age & Life Expectancy: Medians and Distributions

Walter et al, JAMA, 2001, 285
Question to Answer

- Which older patients with cancer are robust, which are frail, and which are “vulnerable”?

Patient: H.F.
Age: 70
Health status: Excellent
Life Expectancy: 18 years

Patient: J.N.
Age: 76
Health status: Fair
Life Expectancy: 9 years

Patient: D.C.
Age: 72
Health status: Poor
Life Expectancy: 4 years
Can Doctors Estimate Life Expectancy?
Life Expectancy Estimation

• Physician Estimate – Accuracy & Caveats
  – Over-estimate patient RLE
  – Over-report over-estimate to patient
  – Dislike offering prognosis

• Patients on physicians:
  – 75% want MD to discuss life-expectancy
  – 64% disagreed/strongly disagreed with the statement "I feel that my main doctor can correctly estimate how long I might live".

A Better Approach to Estimation: Comprehensive Geriatric Assessment (CGA)

• CGA is an approach to the evaluation of the older cancer patients

• Includes an evaluation of:
  1. Comorbidities
  2. Functional status
  3. Nutritional status
  4. Geriatric syndromes
  5. Cognition
  6. Psychological status
  7. Social support

Each domain independently predicts morbidity and/or mortality in older patients
Dementia & Cancer Mortality

Raji MA et al, Arch Int Med, 2008
Are Informative Geriatric Assessment Tools Available?
Screening: Vulnerable Elders’ Survey (VES-13)

- **Age**
  - 75-84 years +1
  - ≥ 85 years +3

- **Self-rated health**
  - Fair or poor +1

- **Physical function limitation**
  - Count = 1 +1
  - Count ≥ 2 +2

- **Functional disability**
  - Any of 5 IADL/ADLS +4
VES-13 Predicts Overall Survival in Colon Cancer Patients on Chemotherapy

Ramsdale et al, JAGS, 2013
Short Physical Performance Battery (SPPB)

1. Timed 4-meter walk $\rightarrow$ Gait Speed

2. Timed Repeat Chair Stand $\rightarrow$ Strength

3. Standing balance (up to 10 seconds)

Mortality Rates by SPPB Summary Score

<table>
<thead>
<tr>
<th>Base Model</th>
<th>Major Complications</th>
<th>Surgical ICU Admission</th>
<th>Days in Hospital</th>
<th>Rehabilitation Discharge</th>
<th>30 Day Readmission</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR</td>
<td>P-value</td>
<td>OR</td>
<td>P-value</td>
<td>β</td>
</tr>
<tr>
<td>Age</td>
<td>1.03</td>
<td>0.22</td>
<td>1.04</td>
<td>0.22</td>
<td>0.22</td>
</tr>
<tr>
<td>BMI</td>
<td>1.10</td>
<td>0.07</td>
<td>0.96</td>
<td>0.39</td>
<td><strong>0.30</strong></td>
</tr>
<tr>
<td>ASA</td>
<td>0.68</td>
<td>0.43</td>
<td>2.41</td>
<td>0.16</td>
<td>-0.10</td>
</tr>
<tr>
<td>Comorbidity</td>
<td>0.90</td>
<td>0.50</td>
<td>1.16</td>
<td>0.36</td>
<td>0.00</td>
</tr>
<tr>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight Loss</td>
<td>0.81</td>
<td>0.70</td>
<td>2.17</td>
<td>0.23</td>
<td>0.08</td>
</tr>
<tr>
<td>Exhaustion</td>
<td><strong>4.06</strong></td>
<td><strong>0.01</strong></td>
<td><strong>4.30</strong></td>
<td><strong>0.01</strong></td>
<td><strong>0.27</strong></td>
</tr>
<tr>
<td>Weakness</td>
<td>0.70</td>
<td>0.51</td>
<td>1.70</td>
<td>0.37</td>
<td>-0.09</td>
</tr>
<tr>
<td>Walk Time</td>
<td>-0.02</td>
<td>0.96</td>
<td>0.82</td>
<td>0.57</td>
<td>-0.07</td>
</tr>
<tr>
<td>Chair stands</td>
<td>0.82</td>
<td>0.34</td>
<td>0.74</td>
<td>0.20</td>
<td>-0.01</td>
</tr>
<tr>
<td>SPPB</td>
<td>1.06</td>
<td>0.62</td>
<td>0.93</td>
<td>0.55</td>
<td>0.12</td>
</tr>
<tr>
<td>VES-13</td>
<td>1.05</td>
<td>0.80</td>
<td>1.16</td>
<td>0.47</td>
<td>0.13</td>
</tr>
<tr>
<td>Memory Score</td>
<td>0.97</td>
<td>0.65</td>
<td>1.06</td>
<td>0.45</td>
<td>0.07</td>
</tr>
</tbody>
</table>
### Geriatric Deficits, Men on ADT

<table>
<thead>
<tr>
<th>Test</th>
<th>Geriatric Domain</th>
<th>Score Range</th>
<th>Cutoff Point Associated with Adverse Outcomes*</th>
<th>Median (Range)</th>
<th>Impaired (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VES-13</td>
<td>Functionally based screening measure</td>
<td>0-10</td>
<td>≥3</td>
<td>2.5 (0-9)</td>
<td>50.0</td>
</tr>
<tr>
<td>ADLs</td>
<td>Function</td>
<td>0-16</td>
<td>&lt;14 (dependence in any ADL)</td>
<td>16 (4-16)</td>
<td>24.0</td>
</tr>
<tr>
<td>IADLs</td>
<td>Function</td>
<td>0-14</td>
<td>&lt;12 (dependence in any IADL)</td>
<td>13 (2-14)</td>
<td>42.0</td>
</tr>
<tr>
<td>CALGB Charlson Comorbidity Score</td>
<td>Comorbidity</td>
<td>0-54</td>
<td>&gt;10 or ≥2 comorbidities that “somewhat interfere” with daily function</td>
<td>15 (0-48)</td>
<td>34.0</td>
</tr>
<tr>
<td>Medications (n)</td>
<td>Comorbidity/toxicity potential from side effects, drug interactions</td>
<td>0-∞</td>
<td>≥5</td>
<td>4 (0-11)</td>
<td>46.0</td>
</tr>
<tr>
<td>Rand Medical Social Support Scale</td>
<td>Social support/access to medical care and support</td>
<td>0-5</td>
<td>&lt;4</td>
<td>5 (0-5)</td>
<td>18.0</td>
</tr>
<tr>
<td>SPMSQ</td>
<td>Cognition/risk of dementia</td>
<td>0-10</td>
<td>≥3 errors</td>
<td>1 (0-6)</td>
<td>24.0</td>
</tr>
<tr>
<td>MNA</td>
<td>Nutritional assessment</td>
<td>0-14</td>
<td>≤11</td>
<td>11 (8-13)</td>
<td>8</td>
</tr>
<tr>
<td>SF-36: Did you feel worn out (during previous 4 wk)?</td>
<td>Fatigue</td>
<td>0-5</td>
<td>≤2</td>
<td>4 (1-5)</td>
<td>14</td>
</tr>
<tr>
<td><strong>Summary of deficits within physical performance measures</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPPB</td>
<td>Objective evaluation of physical performance</td>
<td>0-12</td>
<td>≤9</td>
<td>9 (0-12)</td>
<td>56.0</td>
</tr>
<tr>
<td>Falls within past 3 mo (n)</td>
<td>Objective evaluation of Physical Performance</td>
<td>0-∞</td>
<td>&gt;0</td>
<td>0 (0-4)</td>
<td>22.0</td>
</tr>
<tr>
<td>Physical disability assessment within VES-13</td>
<td>Self-perceived physical health</td>
<td>0-2</td>
<td>&gt;0</td>
<td>0 (0-2)</td>
<td>52.0</td>
</tr>
</tbody>
</table>

Predicting Chemotherapy Toxicity in Older Adults With Cancer: A Prospective Multicenter Study

## Predictive Model

<table>
<thead>
<tr>
<th>Risk factors for Gr. 3-5 Toxicity</th>
<th>OR (95% CI)</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age ≥73 yrs</td>
<td>1.8 (1.2-2.7)</td>
<td>2</td>
</tr>
<tr>
<td>GI/GU cancer</td>
<td>2.2 (1.4-3.3)</td>
<td>3</td>
</tr>
<tr>
<td>Standard dose</td>
<td>2.1 (1.3-3.5)</td>
<td>3</td>
</tr>
<tr>
<td>Poly-chemotherapy</td>
<td>1.8 (1.1-2.7)</td>
<td>2</td>
</tr>
<tr>
<td>Hemoglobin (male: &lt;11, female: &lt;10)</td>
<td>2.2 (1.1-4.3)</td>
<td>3</td>
</tr>
<tr>
<td>Creatinine Clearance &lt;34</td>
<td>2.5 (1.2-5.6)</td>
<td>3</td>
</tr>
<tr>
<td>1 or more falls in last 6 months</td>
<td>2.3 (1.3-3.9)</td>
<td>3</td>
</tr>
<tr>
<td>Hearing impairment (fair or worse)</td>
<td>1.6 (1.0-2.6)</td>
<td>2</td>
</tr>
<tr>
<td>Limited in walking 1 block (MOS)</td>
<td>1.8 (1.1-3.1)</td>
<td>2</td>
</tr>
<tr>
<td>Assistance required in medications</td>
<td>1.4 (0.6-3.1)</td>
<td>1</td>
</tr>
<tr>
<td>Decreased social activity (MOS)</td>
<td>1.3 (0.9-2.0)</td>
<td>1</td>
</tr>
</tbody>
</table>
Model Performance:
Prevalence of Toxicity by Score

ROC: 0.72

Prevalence of Toxicity by Score:

- **Grade 3-5 Toxicities Total Score**
  - N=39
  - N=64
  - N=123
  - N=36
  - N=50
  - N=161

- **Prevalence by Score:**
  - "Low" 27% (0 to 5)
  - "Mid" 53% (6 to 11)
  - "High" 83% (≥12)

- **ROC:** 0.72
MD-rated KPS vs. Model

Chi-square test

\[ p = 0.17 \]

Chi-square test

\[ p < 0.0001 \]
Schema for CGA for Identification of Older Cancer Patients Needing Palliative Care

- **Age > 65**
  - **No apparent**
    - **Screen**
      - **Negative: No CGA**
      - **Fit full-dose**
  - **Looks age**
    - **Screen & CGA**
      - **Vulnerable**
      - **CGA referral**
      - **Palliative**
    - **Frail**
  - **Obvious frail**
    - **CGA**
    - **Frail**
    - **Palliative**
Relationship of Geriatric Assessments to Symptom Burdens

- Physical Activity Impaired
- SPPB Score <9
- IADL Impairment
- History of falls

Low Symptom Burden vs. High Symptom Burden (Top 20%)
Making Choices
• Men over 65

• Biochemical prostate cancer recurrence

• ADT started by clinical decision
Starting Hormone Therapy

**Table 2. Treatment Factors**

<table>
<thead>
<tr>
<th>Variable</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSA doubling time*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient preference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time from primary treatment to PSA increase*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSA level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient remaining life expectancy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gleason grade*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 5. Log Rank Analysis**

<table>
<thead>
<tr>
<th>Predictor Variable</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current health</td>
<td>0.87</td>
<td>0.40 to 1.88</td>
</tr>
<tr>
<td>PSA doubling time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time to recurrence</td>
<td>0.98</td>
<td>0.96 to 1.00</td>
</tr>
<tr>
<td>PSA</td>
<td>1.23</td>
<td>1.03 to 1.47</td>
</tr>
<tr>
<td>Gleason score ≥ 8</td>
<td>0.72</td>
<td>0.09 to 5.75</td>
</tr>
<tr>
<td>Elevated MAX-PC</td>
<td>7.11</td>
<td>1.33 to 37.52</td>
</tr>
</tbody>
</table>

Abbreviations: ADT, androgen deprivation therapy; CI, confidence interval.

**Graph**

- MAX-PC not elevated: Blue line
- MAX-PC elevated: Yellow line
- Not elevated-censored: Blue plus symbol
- Elevated-censored: Yellow plus symbol

**Additional Time on Hormones = 14 Months**
# Toxicities from Hormone Therapy: A Geriatrician’s Perspective

<table>
<thead>
<tr>
<th>ADT Toxicities</th>
<th>Frailty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fatigue</td>
<td>1. Fatigue</td>
</tr>
<tr>
<td>2. Weakness</td>
<td>2. Weakness</td>
</tr>
<tr>
<td>4. Lean Weight Loss</td>
<td>4. Lean Weight Loss</td>
</tr>
<tr>
<td>5. Low Energy</td>
<td>5. Low Energy</td>
</tr>
</tbody>
</table>

A Modest Proposal
Can A Special Clinic Help Solve These Issues?
It Is Time for Geriatricized Cancer Care?
Needed Structural Changes

1. Sufficient time for Geriatric Assessments

2. Provide geriatrics-specific training to support staff

3. Exam rooms and equipment that accommodates older patients for assessments

4. Resources to facilitate/support caregivers and transportation

5. Allow for data collection from remote areas with technology to facilitate data collection
Multidisciplinary Oncology Clinic for Older Adults

• **Name:** Specialized Oncology Care and Research for the Elderly (SOCARE)

• **Purpose:** To provide a resource where oncologists, surgeons, radiation oncologists, palliative care physicians, and geriatricians can seek a comprehensive evaluation and opinion regarding cancer care for an older person.

• **Partners:** Partners with similar clinics at the University of Rochester and University of Virginia.
Collaborative Model of Cancer Management for Older Adults

- **Oncology**: Stage the Cancer
  - Disease Extent
  - Cancer-based prognosis

- **Geriatrics**: Stage the Aging
  - Life Expectancy Estimation
  - Quality of Life Determination
  - Patient-based prognosis

- **Palliative Care**: Stage the Symptoms
  - Disease burden
  - Treatment Burden

Truly Personalized Medicine for the Older Cancer Patient

Elderly patients with cancer

- Comprehensive geriatric assessment (CGA)
- Comprehensive oncological assessment (COA)

Palliative Care assessment

Multidisciplinary decision making meeting

Individualized care program comprehensive co-management and follow-up
SOCARE Clinic:
Oncology-Embedded Geriatrics

- Started in 2006
- Close Collaboration with Oncology
- Aging Assessment
- Clinical
- Teaching
- Research Hub
Participants

**Weekly**
- Geriatric Oncology
- A resident or fellow
- Nurse practitioner
- Health Project Coordinator
- Social Worker
- Pharmacist

**Biweekly or Monthly**
- Nutritionist
- Physical Therapist
- Occupational Therapist
Additional Elements

1. Sufficient time/space for Geriatric Assessments
2. Provide geriatrics-specific training to support staff
3. Exam rooms and equipment that accommodates older patients for assessments
4. Resources to facilitate/support caregivers and for transportation
5. Allow for information collection from remote areas with technology to facilitate evaluation
## SOCARE Referral Reasons

Table 3. Primary Reason for Patient Referral

<table>
<thead>
<tr>
<th>Referral Reason</th>
<th>Percentage of Patients (n=107)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comprehensive Geriatric Assessment</td>
<td>15.9%</td>
</tr>
<tr>
<td>Recommendations Regarding Continuing Tx</td>
<td>10.3%</td>
</tr>
<tr>
<td>Recommendations Regarding Tx Initiation</td>
<td>38.3%</td>
</tr>
<tr>
<td>Initial Disease Management</td>
<td>29.9%</td>
</tr>
<tr>
<td>Questions Related to a Specific Problem</td>
<td>2.8%</td>
</tr>
<tr>
<td>Support Through Treatment/Outcome Improvement</td>
<td>2.8%</td>
</tr>
</tbody>
</table>
Timeline

Clinic Started
1. Me
2. Fellow

2nd Provider
1. Me
2. Fellow
3. Jim Wallace (Geriatric-Oncology)

3rd Provider
1. Me
2. Fellow
3. Residents
4. Jim Wallace
5. APN

4th Provider
1. Me
2. Fellow
3. Residents
4. Wallace
5. APN
6. Monica Malec (PM)

5-6th Providers
1. Me
2. Fellow
3. Residents
4. Jim Wallace
5. APN
6. Malec (PM)
7. Chow (GO)
8. Rhee (PM)
Why Allowed to Grow?

• Philosophical Commitment to Quality Care
• Addictive Drug Model of Growth
• National Policy Changes
• Policy “Windows”
Developing Plans

- A “National Standard” for Older Adult Evaluations
  - BM Transplant in Older Adults
  - Pancreatic Surgery Cancer Evaluation
  - Electronic Medical Record Tools

- Funding
  - U13
  - PCORI
  - RO3, RO1

- Training
  - 8 Geri-Onc Fellows trained to date

- Consultations
  - AGS, ASCO, Reynolds
  - U Toronto, UVa, UCSF
Colleagues
Professional & Personal
Thanks!

wdale@medicine.bsd.uchicago.edu

@WilliamDale_MD

https://chicago.academia.edu/WilliamDale