WHERE IS MEDICAL EDUCATION GOING IN THE NEW WORLD OF VALUE BASED COMPENSATION?

REYNOLDS 2016

ERIC HOLMBOE
WONDERFUL TO BE BACK AS AN OLDER ADULT

2007

2016
CHARLES

Charles is a 83 y.o. PhD trained mechanical engineer still working when he suffers an acute, extensive large bowel infarction due to incarceration.

Despite 2 operations, delirium and a week long ICU stay, Charles is successfully transferred to the medical ward, under the care of rotating hospitalists, for continued recovery, PT and therapy for swallowing dysfunction.
Unfortunately, multiple medical misadventures ensue:

1. Delayed diagnosis of HAPneumonia
2. Delayed diagnosis and treatment of pseudogout
3. Stage 3 sacral decubital ulcer
4. Poor care coordination between cardiologist, infectious disease and multiple hospitalists
5. Repeated hand-off errors
Despite all this and more, Charles is ultimately discharged to a (for profit) “rehab” facility where:

1. He continues to receive, for unclear reasons, multiple salt tablets daily, leading to anasarca
2. Unnecessary trip to ED due to diagnostic error
3. Second case of pneumonia due to feeding error
4. Multiple missed PT sessions
IATROGENICALLY-INDUCED ALLOSTASIS

Charles loses ground and is subsequently discharged from the rehab center to home under hospice care.

On discharge he describes his rehab center experience as being “treated like a thing.”

He dies 8 days after discharge.

CHARLES’ CARE: DISCUSS

• Have you ever experienced this with a family member or as a health care professional?
• What outcomes, or lack thereof, are demonstrated in Charles’ story?
• How could an outcomes/competency-based approach have helped Charles’ healthcare professionals provide more effective care?
WHAT ARE THE MOST IMPORTANT OUTCOMES AND HOW ARE WE DOING?
THE ULTIMATE OUTCOMES FOR CLINICAL CARE & EDUCATION

Health of a Population

Experience of Care
- Safe
- Effective
- Patient centered
- Efficient
- Timely
- Equitable

Per Capita Cost

The IHI Triple Aim

Better care for individuals, better health for populations, lower per capita costs
<table>
<thead>
<tr>
<th>Country</th>
<th>AUS</th>
<th>CAN</th>
<th>FRA</th>
<th>GER</th>
<th>NETH</th>
<th>NZ</th>
<th>NOR</th>
<th>SWE</th>
<th>SWIZ</th>
<th>UK</th>
<th>US</th>
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<td><strong>Overall Ranking (2013)</strong></td>
<td>4</td>
<td>10</td>
<td>9</td>
<td>5</td>
<td>5</td>
<td>7</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td>1</td>
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<td><strong>Quality Care</strong></td>
<td>2</td>
<td>9</td>
<td>8</td>
<td>7</td>
<td>5</td>
<td>4</td>
<td>11</td>
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<td><strong>Effective Care</strong></td>
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<td>7</td>
<td>9</td>
<td>6</td>
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<td><strong>Safe Care</strong></td>
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<td>7</td>
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<td><strong>Coordinated Care</strong></td>
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<td>9</td>
<td>10</td>
<td>5</td>
<td>2</td>
<td>7</td>
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<td>3</td>
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<td>6</td>
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<td><strong>Patient-Centered Care</strong></td>
<td>5</td>
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<td>11</td>
<td>9</td>
<td>2</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td><strong>Access</strong></td>
<td>8</td>
<td>9</td>
<td>11</td>
<td>2</td>
<td>4</td>
<td>7</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>9</td>
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<tr>
<td><strong>Cost-Related Problem</strong></td>
<td>9</td>
<td>5</td>
<td>10</td>
<td>4</td>
<td>8</td>
<td>6</td>
<td>3</td>
<td>1</td>
<td>7</td>
<td>1</td>
<td>11</td>
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<tr>
<td><strong>Timeliness of Care</strong></td>
<td>6</td>
<td>11</td>
<td>10</td>
<td>4</td>
<td>2</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>1</td>
<td>3</td>
<td>5</td>
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<tr>
<td><strong>Efficiency</strong></td>
<td>4</td>
<td>10</td>
<td>8</td>
<td>9</td>
<td>7</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>6</td>
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<td>11</td>
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<td><strong>Equity</strong></td>
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<td>9</td>
<td>7</td>
<td>4</td>
<td>8</td>
<td>10</td>
<td>6</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>11</td>
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<tr>
<td><strong>Healthy Lives</strong></td>
<td>4</td>
<td>8</td>
<td>1</td>
<td>7</td>
<td>5</td>
<td>9</td>
<td>6</td>
<td>2</td>
<td>10</td>
<td>11</td>
<td></td>
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<tr>
<td><strong>Health Expenditures/Per Capita, 2011</strong></td>
<td>$3,800</td>
<td>$4,522</td>
<td>$4,118</td>
<td>$4,495</td>
<td>$5,099</td>
<td>$3,182</td>
<td>$5,669</td>
<td>$3,925</td>
<td>$5,643</td>
<td>$3,405</td>
<td>$8,508</td>
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</tbody>
</table>

Notes: * Includes ties. ** Expenditures shown in $US PPP (purchasing power parity); Australian $ data are from 2010.
DIAGNOSTIC ERRORS (2015)

IOM Report
Released September 2015

- At least 5 percent of U.S. adults who seek outpatient care each year experience a diagnostic error.
- Postmortem examination research shows diagnostic errors consistently contribute to ~10 percent of patient deaths.
- Diagnostic errors account for 6 to 17 percent of hospital adverse events.
Some successes, but many gaps remain.
Institutions must embrace safety as a core value
“Advancing patient safety requires an overarching shift from reactive, piecemeal interventions to a total systems approach”

- Cancer: 585k
- Medical error: 251k
- Heart disease: 611k
- COPD: 149k
- Suicide: 41k
- Motor vehicles: 34k
- Firearms: 34k

All causes: 2,597k

Based on our estimate, medical error is the 3rd most common cause of death in the US.

However, we’re not even counting this - medical error is not recorded on US death certificates.

Data source: [http://www.cdc.gov/nchs/data/nvss/nvss64/nvss64_02.pdf](http://www.cdc.gov/nchs/data/nvss/nvss64/nvss64_02.pdf)

Fig 1 Most common causes of death in the United States, 2013

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## QUALITY OF CARE: OLDER ADULTS

<table>
<thead>
<tr>
<th>Documentation of:</th>
<th>Resident Clinics (%)</th>
<th>Practicing Physicians (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gait evaluation</td>
<td>28</td>
<td>74**</td>
</tr>
<tr>
<td>Balance evaluation</td>
<td>22</td>
<td>66**</td>
</tr>
<tr>
<td>Medical surrogate</td>
<td>28</td>
<td>54**</td>
</tr>
<tr>
<td>End-of-life preferences</td>
<td>29.5</td>
<td>49**</td>
</tr>
<tr>
<td>Vision testing done</td>
<td>40</td>
<td>65**</td>
</tr>
<tr>
<td>Hearing assessment</td>
<td>23</td>
<td>40*</td>
</tr>
</tbody>
</table>

### Screening for:

<table>
<thead>
<tr>
<th></th>
<th>Resident Clinics (%)</th>
<th>Practicing Physicians (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Falls risk</td>
<td>19</td>
<td>61**</td>
</tr>
<tr>
<td>Cognitive impairment</td>
<td>18</td>
<td>52**</td>
</tr>
<tr>
<td>Depression</td>
<td>34</td>
<td>63**</td>
</tr>
</tbody>
</table>

* p < .01, ** p < .001

Lynn LA, Hess BJ, Conforti LN, Lipner RS, Holmboe ES. The Relationship Between Clinic Systems and Quality of Care for Older Adults in Residency Clinics and in Physician Practices. Acad Med. 2009; 84(12): 1732-1740
GUT CHECK...

• Does anyone really want to take their older parent or grandparent (assuming you love them of course) to a clinic that provides evidence-based care less than 40% of the time?

• Do you really know if your learners are providing, and your patients receiving, high quality and safe care?
• How can the principles, philosophy and competencies of geriatrics help to improve:
  • Care of the older adult?
  • Care of the patient with multiple morbidities?
THE RISE OF OUTCOMES-BASED EDUCATION
EARLY PRINCIPLES

• World Health Organization (1978):
  – “The intended output of a competency-based programme is a health professional who can practise medicine at a defined level of proficiency, in accord with local conditions, to meet local needs.”

This new “medical-industrial complex” may be more efficient than its nonprofit competition, but it creates the problems of overuse and fragmentation of services, overemphasis on technology, and “cream skimming,” and it may also exercise undue influence on national health policy...physicians must act as discerning agents for their patients and therefore have no conflicting financial interests.
**U.S. COMPETENCY JOURNEY: PHASE 1**

<table>
<thead>
<tr>
<th>Dates</th>
<th>Event/Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>ACGME begins work on developing competencies</td>
</tr>
<tr>
<td>1999</td>
<td>Six general competency framework approved by ABMS/ACGME</td>
</tr>
<tr>
<td>2001</td>
<td>Launch of Outcomes Project</td>
</tr>
</tbody>
</table>
1. Research and the Clinical Learning Environment Review Program

2. Milestones and Entrustable Professional Activities

3. Growing programs of work-based assessment and Clinical Competency Committees
4. There must be better balance between educational experiences in the ambulatory and hospital settings.

5. Stakeholders should work with regulatory organizations to permit greater flexibility to promote innovative approaches to training.

6. Clinical work and educational processes in teaching hospitals and clinics need substantial redesign.
Three-pronged approach to building capacity:
1. Enhancing competence
2. Increasing recruitment and retention of geriatric specialists and caregivers
3. Implementing innovative models of care
OBME: START WITH SYSTEM NEEDS

DRIVERS OF THE DISCONTENT

- Rapid expansion of medical knowledge
  - Can no longer carry everything in your head
- Escalating complexity of medical care
- Aging populations
- Increasing burden of chronic disease
- Recognition of uneven quality and safety in clinical care delivery
- Rising healthcare costs
- Education – clinical care delivery mismatch
• Looking back the last 15 years from the launch of the competency movement:
  – What did these reports “get right?”
  – What remains to be done?
  – What should we let go of?
WHERE TO NEXT: ENHANCING THE VALUE OF EDUCATION AND CLINICAL CARE
OUTLINE

• Rethinking curriculum: patient from “object” to “subject.”
• Rethinking assessment: from proxies to authentic.
• Should residents and fellows train in poorly performing institutions?
• Think developmentally.
• Co-production to integrate education and clinical care.
• Implementation is now the main issue.
RETHINKING CURRICULUM: PATIENT FROM “OBJECT” TO “SUBJECT”
**Figure 1** Schematic of the traditional academic faculty perspective and the current educational design of graduate medical education programs, which often consider educational outcomes as separate from clinical outcomes. As a result, educational outcomes are often centered around the learner, and clinical outcomes are often centered around the patient. This perspective tends to place greater emphasis on learner–patient interactions than on learner–patient–clinical microsystem interactions.
HOW NOT TO BUILD A CURRICULUM

Geriatric rotation
Figure 2 Schematic of the proposed framework for academic faculty perspective and educational design of graduate medical education training programs, where both educational and clinical outcomes are centered around the patient. This reorganization recognizes that (1) the dynamic interplay between the faculty, learner, training program, and clinical microsystem ultimately influences the quality of physician that emerges from the training program and the environment, and (2) patient outcomes relate to the quality of education and the success of clinical microsystems.
• How can the geriatric community continue to leverage and expand its wonderful work in curricular content and design to help the broader educational community?
RETHINKING ASSESSMENT: FROM PROXIES TO AUTHENTIC
Miller Assessment Pyramid 1990

- Knows (knowledge)
- Knows How (competence)
- Shows How (performance)
- Does (action)

“Proxies”

- Standardized Patients/ Simulation
- Diagnostic Reasoning using clinical vignettes or CSR
- Multiple choice Questions
YOU CANNOT FUNCTION WITH AN EMPTY HARD DRIVE, BUT...
CLINICAL QUESTIONS RAISED BY CLINICIANS AT THE POINT OF CARE

- Systematic Review (11 articles):
  - Mean frequency of questions = 0.57 per patient visit
    - GIM Physician: Roughly 90 visits/week
    - Assuming conservative estimate of 46 weeks of work/year
      - # of questions ≈ 2,228 per year or ≈22,000+ over 10 years
  - Physicians pursued 51% (range 36-66%) of questions
    - Found answers for 78% (range 67-88%)
  - No amount of testing is going to “fix this”

• Hypothetical 79-year-old woman with chronic obstructive pulmonary disease, type 2 diabetes, osteoporosis, hypertension, and osteoarthritis
  – 12 medications recommended
  – Complicated nonpharmacologic regimen
  – Adverse interactions possible with regimen
WHAT IF ASSESSMENT ALIGNED WITH PATIENT CARE?

**System Context**

Trainee performance* \( \times \) Appropriate level of supervision**

*Must* = Safe, effective patient-centered care

**Collective Competence**

* a function of level of competence in context
**a function of attending competence in context

Assessing for the Desired Outcome

Work-based assessment is mostly accomplished through the **observations and questions** of patients, faculty, team members, peers and other co-workers.

- Work-based assessment is mostly accomplished through the observations and questions of patients, faculty, team members, peers and other co-workers.

- **Knows** (knowledge)

- **Knows How** (competence)

- **Shows How** (performance)

- **Does** (action)

- **Performance in Practice/Multi-source feedback/ Direct Observation**

- **Standardized Patients/Simulation**

- **Diagnostic Reasoning using clinical vignettes or CSR**

- **Multiple choice Questions**
Model For Programmatic Assessment
(With permission from CPM van der Vleuten)

- Training Activities
- Assessment Activities
- Supporting Activities

Committee

○ = learning task
○ = learning artifact
△ = single assessment data-point
◆ = single certification data point for mastery tasks
○—○ = learner reflection and planning
○—○ = social interaction around reflection (supervision)

= learning task being an assessment task also

Time
MAJOR TRENDS IN ASSESSMENT

- Developmental and competency-based
- Greater focus on connecting educational and clinical outcomes
- Moving away from “proxies” and an over-reliance of psychometrically-based assessment (e.g. tests)
- Concept of entrustment for supervision
- Programs of assessment
- Group process in judgments of competence and professional development
SHOULD RESIDENTS AND FELLOWS TRAIN IN POORLY PERFORMING INSTITUTIONS?

[HINT – NO]
TRAINING ENVIRONMENT AFFECTS PRACTICE

- Asch
  - Obstetrical complications
- Chen
  - Costs of care in practice
- Sirovich
  - Appropriate conservative management (on exam)
- Bansal
  - Surgical complications
- Tamblyn
  - Prescribing patterns (med students)
Evaluate Residency Programs Using Patient Outcomes


Rate of Major Obstetric Complications by Graduates (%)

- Difference remains after correction for USMLE Exam performance
- Excess Risk Δ 32% Q1 vs Q5

Residency Program of Origin, Ranked (Quintile) by Program Complication Rate
1. **Training Site Matters.** Where an obstetrician trained is strongly associated with later maternal complication rates.

2. **Experience Matters.** New obstetricians improve steadily with additional years of experience, an effect that continues through 30 years.

3. **Initial Skill Matters.** *But,* obstetrician initial skill explains more of between-physician variation than does scale, learning-by-doing, and years of experience.

*Slide Courtesy David Asch*
CHOOSING RESIDENCY: TIME TO USE NEW DATA?

Average # of physician visits in last six months of life (teaching hospitals in red)

From:
What Kind of Physician Will You Be?
Variation in Health Care and Its Importance for Residency Training
Dartmouth Institute for Health Policy & Clinical Practice 2012

Figure 2. Average number of physician per chronically ill Medicare patient during the last six months of life among patients receiving most of their care at teaching hospitals (2010 deaths)
Table 3. Adjusted Patient Expenditures for Primary Care

<table>
<thead>
<tr>
<th></th>
<th>All Physicians</th>
<th>1-7 Years</th>
<th>8-15 Years</th>
<th>16-19 Years</th>
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<td><strong>β (95% CI)</strong></td>
<td><strong>P Value</strong></td>
<td><strong>β (95% CI)</strong></td>
<td><strong>P Value</strong></td>
<td><strong>β (95% CI)</strong></td>
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<td>Physicians, No.</td>
<td>2851</td>
<td>480</td>
<td>1694</td>
<td>677</td>
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<td>302 869</td>
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<td>beneficiaries, No.</td>
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<tr>
<td>Training HRR</td>
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<td>spending&lt;sup&gt;c&lt;/sup&gt;</td>
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<tr>
<td>Low</td>
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</tr>
<tr>
<td>Average</td>
<td>0.05 (0.00 to 0.09)</td>
<td>.04</td>
<td>0.22 (0.01 to 0.44)</td>
<td>.04</td>
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<tr>
<td>High</td>
<td>0.07 (0.02 to 0.12)</td>
<td>.007</td>
<td>0.29 (0.13 to 0.45)</td>
<td>&lt;0.001</td>
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</table>

THINK DEVELOPMENTALLY...
MAKING SENSE OF COMPETENCIES

- Milestones
- Entrustable professional activities (EPAs)
- Assessments aligned with development, entrustment and supervision
MILESTONES: GENERAL TO SPECIALTY-SPECIFIC

<table>
<thead>
<tr>
<th>General Competencies</th>
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<tbody>
<tr>
<td>Patient Care</td>
</tr>
<tr>
<td>Medical Knowledge</td>
</tr>
<tr>
<td>Professionalism</td>
</tr>
<tr>
<td>Interpersonal Skills &amp; Communication</td>
</tr>
<tr>
<td>PBL &amp; I</td>
</tr>
<tr>
<td>Systems-based Practice</td>
</tr>
</tbody>
</table>

Specialty Specific Milestones
ENTRUSTABLE PROFESSIONAL ACTIVITIES

- EPAs represent the routine professional-life activities of physicians based on their specialty and subspecialty.
- The concept of “entrustable” means:
  - “a practitioner has demonstrated the necessary knowledge, skills and attitudes to be trusted to perform this activity [unsupervised].”

COMPETENCY VS. EPAS

- Competencies define the core *abilities* of the individual (i.e. educational outcomes)
- EPAs define the core *activities* health professionals do in daily practice.
- Competencies are needed by the individual in order to effectively perform the professional activity.
PROFESSIONAL DEVELOPMENT: DREYFUS MODEL

MILESTONES/EPAS Guiding an Integrated Curriculum and Program of Assessment

- Novice
- Advanced Beginner
- Competent
- Proficient
- Expert/Master

Development is a non-linear phenomenon

Time, Practice, Experience

Dreyfus SE and Dreyfus HL. 1980
Carraccio CL et al. Acad Med 2008;83:761-7
WHERE WE ARE...

- Competencies make what has been *implicit* in medical education *explicit*.
  - Shared understanding and mental models
- Competencies enable a healthy examination of what it takes and means to be a proficient healthcare professional
- The newer concepts of Milestones and EPAs are designed to help *operationalize* the competencies in more practical terms and language
CO-PRODUCTION TO INTEGRATE EDUCATION AND CLINICAL CARE
The interdependent work of users and professionals to design, create, develop, deliver, assess and improve the relationships and actions that contribute to the health of individuals and populations.

*Slide courtesy of Paul Batalden*
HEALTHCARE SERVICE CO-PRODUCTION MODEL


Let’s walk through the Model Together
Patients

Professionals

Co-execution

Co-planning

Civil discourse

Healthcare system

Community and society

Co-produced high value healthcare service

Good health for all
Community and society

Healthcare professions education system

Coexecution

Coplanning

Civil discourse

Learners

Teachers

Coproduced high value learning for healthcare professionals and patients

Providers and patients who coproduce healthcare

Adapted from - Figure 3 Conceptual model of healthcare service Coproduction. from Batalden M, et al. BMJ Qual Saf 2015; 0:1-9.
## PROFESSIONAL DEVELOPMENT AS CO-PRODUCTION

<table>
<thead>
<tr>
<th>Element</th>
<th>Implications for Outcomes-based Medical Education.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Readiness</td>
<td>Be ready mentally and emotionally to engage in improving both clinical care and professional development.</td>
</tr>
<tr>
<td>Curiosity</td>
<td>Always ask questions and seek answers. Identity trustworthy sources of information that must include patients, families, learners, faculty and other professionals</td>
</tr>
</tbody>
</table>

Holmboe ES and Batalden P. Achieving the Desired Transformation: Thoughts on Next Steps for Outcomes-based Medical Education. Acad Med. 2015 Sep; 90(9):1215-23
<table>
<thead>
<tr>
<th>Element</th>
<th>Implications for Outcomes-based Medical Education.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reframe</td>
<td>Turn challenges into opportunities for learning and improvement, letting go of educational approaches and design that no longer work well. Keep parts from the past that are still important.</td>
</tr>
<tr>
<td>Listen and Learn</td>
<td>Seek out new knowledge and be willing to engage in dialogue about disconfirming data that challenges past beliefs. Learn and listen from others, most importantly from patients.</td>
</tr>
<tr>
<td>Participate</td>
<td>Be fully present, open and personally participate to make things better locally. Improvement is a group effort that takes time and commitment to see measured and meaningful results.</td>
</tr>
</tbody>
</table>
• The leadership role of geriatrics in the co-production of clinical care and education
IMPLEMENTATION IS NOW THE MAIN ISSUE
“A complex adaptive system is a collection of individual agents with freedom to act in ways that are not always totally predictable, and whose actions are interconnected so that one agent’s actions changes the context of other agents.”

FOSTERING IMPLEMENTATION INTO PRACTICE

• Intervention characteristics
  – Relative advantage, adaptability, complexity
• Outer setting

Geriatrics is a MASTEr at Complexity and Implementation – Embrace it!
  priority, readiness, learning climate
• Characteristics of individuals
  – Safe efficacy, stage of change
• Process
  – Planning, engaging, opinion leaders, champions

CLOSING THOUGHTS...
“Charles” is Dr. Kenneth Charles Holmboe, PhD.

His experience with the healthcare system severely shook my faith, a sort of “mirror to self.”

But it was geriatricians that helped our dad and family.

Our sincere thanks to Rosanne Leipzig and Richard Besdine.
I’M STILL OPTIMISTIC AND HOPEFUL

This will require co-creation, co-production and co-learning approaches to collaboration & implementation
THANK YOU FOR ALLOWING ME TO BE A PART OF THIS SPECIAL COMMUNITY AND THIS CELEBRATION