Health Systems Science: 
The Evolving Identity of Academic Health Centers

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Associate Dean for Health Systems Education
Penn State College of Medicine

Virginia Tech Carilion School of Medicine
February 3rd, 2020
My Team
Upon completion of this session, participants will be able to:

1. Define health systems science – the 4th pillar of medical education,
2. Articulate the significant events that have contributed to the development of health systems science,
3. Highlight several Health Systems Science curricular components that have been implemented along the education continuum,
4. Discuss an evolving identity of academic health centers and how Health Systems Science is contributing to this change.
Health Systems Science definition:
the principles, methods, and practice of improving quality, outcomes, and costs of healthcare delivery for patients and populations within systems of medical care.

Health Systems Science

Basic Science

Clinical Science
HSS Milestones: Past is Prologue

Key Take-Away:
Built on evidence
Focused on patients

The HSS Framework

Welcome to Virginia Tech Carilion School of Medicine

Through a unique public-private partnership between a cutting edge-research university and a major health care institution, the Virginia Tech Carilion School of Medicine educates physician thought leaders, through inquiry, research, and discovery.

The college has four value domains that drive our educational goals and objectives and are interwoven throughout the four-year curriculum: basic science, clinical science, research, and interprofessionalism.
Why does a comprehensive HSS framework matter?

1. Ensures core competencies are not marginalized (e.g. HSS ≠ QI)
2. Accounts for related competencies in curricular design
3. Establishes a foundation for comprehensive pedagogies
4. Provides a clear learning pathway for UME → GME → workforce
5. Facilitates a shift towards a national standard
6. Catalyzes the new healthcare professionalism of systems citizens.
HSS Along the Education Continuum
### HSS Curricular Continuum

<table>
<thead>
<tr>
<th>MS1</th>
<th>MS2</th>
<th>MS3</th>
<th>MS4</th>
<th>GME</th>
<th>CME</th>
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</thead>
</table>
| **Course Title:** Science of Health Systems 1 (65 hr)  
- SDH, pop health, public health, and patient navigation  
- Healthcare delivery, comparative systems  
- Advocacy, interprofessional collaboration  
- Experiential role – student patient navigators * | **Course Title:** Science of Health Systems 2 (40 hr)  
- EBM, safety, system improvement, teamwork, value  
- White Belt Certification in Operational Excellence | **Health Equity Clerkship**  
- Healthcare disparities; SDH  
**Internal Medicine Clerkship**  
- HSS reflection exercise  
**Family Medicine Clerkship**  
- Transitions of care; med reconciliation  
**Several Clerkships**  
- High-value care core curricular session | **Course Title:** Translating Health Systems (2w/50 hr)  
- Application of all HSS principles  
- Team-based projects with specialty coach and op-ex coach  
- Yellow Belt Certification in Operational Excellence  
**HSS Electives:** 4 created, 7 created by summer 2020  
**Course Title:** Transition to Internship (40hr) | | |


Gonzalo et al. A Constructive Reframing of Student Roles Using a “Communities of Practice” Lens. Acad Med 2017


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- SDH, pop health, public health, and patient navigation  
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- Advocacy, interprofessional collaboration  
- Experiential role – student patient navigators * | **Core HSS curricula**  
- Expected of all programs  
- 4 HSS core areas/yr | |
| **Course Title:** Science of Health Systems 2 (40 hr)  
- EBM, safety, system improvement, teamwork, value  
- White Belt Certification in Operational Excellence | **HSS Resident Immersion Week**  
- N=30; from most programs  
- Overlaps with 4th-yr course | |
| **Health Equity Clerkship**  
- Healthcare disparities; SDH  
**Internal Medicine Clerkship**  
- HSS reflection exercise  
**Family Medicine Clerkship**  
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**Several Clerkships**  
- High-value care core curricular session | **Individual Program Initiatives**  
- IM – HSS Curricula  
- FCM – HSS/Pop health  
- Ortho – core QI (since 2011) | |
| **Course Title:** Translating Health Systems (2w/50 hr)  
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**Course Title:** Transition to Internship (40hr) | **Systems-Based Practice and CLE**  
- AMA grant * | |

Gonzalo et al. A Constructive Reframing of Student Roles Using a “Communities of Practice” Lens.  Acad Med 2017  
### HSS Curricular Continuum

<table>
<thead>
<tr>
<th>MS-1</th>
<th>Course Title: Science of Health Systems 1 (65 hr)</th>
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<tr>
<td></td>
<td>• SDH, pop health, public health, and patient navigation</td>
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</tr>
<tr>
<td>MS-2</td>
<td>Course Title: Science of Health Systems 2 (40 hr)</td>
</tr>
<tr>
<td></td>
<td>• EBM, safety, system improvement, teamwork, value</td>
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<tr>
<td></td>
<td>• White Belt Certification in Operational Excellence</td>
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<tr>
<td>MS-3</td>
<td>Health Equity Clerkship</td>
</tr>
<tr>
<td></td>
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<td>MS-4</td>
<td>Course Title: Translating Health Systems (2w/50 hr)</td>
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<tr>
<td></td>
<td>• Application of all HSS principles</td>
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<tr>
<td>HSS Academy</td>
<td>• Year-long program</td>
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<tr>
<td></td>
<td>• Year 1 – 2016-17</td>
</tr>
<tr>
<td></td>
<td>• Interprofessional</td>
</tr>
<tr>
<td></td>
<td>• N=99 scholars</td>
</tr>
<tr>
<td>HSS Resident Immersion Week</td>
<td>• N=30; from most programs</td>
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<tr>
<td></td>
<td>• Overlaps with 4th-yr course</td>
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<tr>
<td>National HSS Academy</td>
<td>• Year 1 – 24 participants</td>
</tr>
<tr>
<td></td>
<td>• Year 2 – 84 applicants</td>
</tr>
<tr>
<td>Individual Program Initiatives</td>
<td>• IM – HSS Curricula</td>
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<td></td>
<td>• FCM – HSS/Pop health</td>
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<tr>
<td></td>
<td>• Ortho – core QI (since 2011)</td>
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<tr>
<td>HSS Seminar Series</td>
<td>• Year 5</td>
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<td></td>
<td>• 6-8 sessions/yr</td>
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<td></td>
<td>• Aligns w/HSS core areas</td>
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<tr>
<td>Systems-Based Practice and CLE</td>
<td>• AMA grant *</td>
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<tr>
<td>Workforce Initiatives</td>
<td>• White/Yellow Belts</td>
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<td>• ACE’s Workshops</td>
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<td>• SDH Simulations</td>
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<td>• Certificate/Master’s</td>
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*Note: MS1, MS2, MS3, MS4, GME, CME correspond to different stages of the medical education program.*

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Three Big Ideas Related to HSS

1. The Expanding Educator Bench of US Medical Schools
2. The New Professionalism: Systems Citizenship
3. HSS Informing the Evolving Identity of AHCs
Big Idea #1:
The Expanding Educator Bench of US Medical Schools
HSS Impacts the Community of Educators

Figure 1. The 12 roles of the teacher.

Harden and Crosby. AMEE Guide No 20: The good teacher is more than a lecturer - the twelve roles of the teacher. Medical Teacher 2000
Gonzalo, Chang, Wolpaw. New Educator Roles for Health Systems Science: Implications for U.S. Medical School Faculty. Academic Medicine 2018
New and Evolving Medical Educator Roles for HSS

<table>
<thead>
<tr>
<th>Categories</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom Instructor (PBL, lecturer)</td>
<td>Evolving role: Hospitalist physician facilitates a small group</td>
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<td></td>
<td>New role: Director of Nursing Ambulatory Care leads social determinants of health workshop</td>
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<tr>
<td>Clinical supervisor (“attending”)</td>
<td>Evolving role: PCP coaches learner through high-value, cost-conscious decision making</td>
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<tr>
<td></td>
<td>New role: QI Chief collaborates with student to align project goals and obtain data</td>
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<tr>
<td>Curriculum Leader/Evaluator</td>
<td>Evolving role: Associate Dean for Evaluation facilitates new HSS assessments</td>
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<td></td>
<td>New role: Associate Dean for HSS Education oversees design of HSS curricula</td>
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<tr>
<td>Mentor or advisor</td>
<td>Evolving role: Clinician-investigator mentors student in informatics research in high-value care</td>
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<tr>
<td></td>
<td>New role: QI/Lean/Black Belt staff mentors student in clinically-based project</td>
</tr>
</tbody>
</table>

**Implication 1:** The “new” educators are already in our community.

**Implication 2:** We can help develop skills of these educators.

**Implication 3:** We can meaningfully acknowledge and “incentivize” these educators.
Big Idea #2:
The New Professionalism: Systems Citizenship

“Is medical education designed to be transformative (e.g., a physician as a refined alloy produced from the ore of a medical student) or additive (she is the same person but with highly enhanced skills in science, technology and humanities)?”
The New Professionalism

Wave 1
“Discovery”

Wave 2
“Definition”

Wave 3
“Measurement”

Wave 4
“Institutionalization”

Next Wave
“Systems Citizenship”

Irby, Hamstra. Parting the Clouds: Three Professionalism Frameworks in Medical Education. Acad Med 2016
Lucey, Souba. The Problem With the Problem of Professionalism. Acad Med 2010
Cruess, Cruess, Steinert. Amending Miller’s Pyramid to Include Professional Identity Formation. Acad Med 2016
Brennan. Physicians’ Professional Responsibility to Improve the Quality of Care. Acad Med 2002
Clinical learning environments need to be transformed

“Systems-Based Practice for the 21st-Century Healthcare System: Developing Residents as Systems Citizens.”

Evolving professionalism in healthcare

**Systems Transformation Network**
- Penn State Health
- Allegheny Health Network
- Geisinger Health
- Kaiser Permanente SOM/Northern CA GME

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LCME Data Collection Inventory; Common Program Requirements.  www.acgme.org
T. Brigham.  Knitting the Continuum Together: Seizing the Opportunity to Improve Medical Education.  www.acgme.org
Gonzalo et al. A Constructive Reframing of Student Roles Using a “Communities of Practice” Lens.  Acad Medicine 2017
Big Idea #3:
HSS Informing the Evolving Identity of AHCs
Exploring Our Evolving Academic Identity in Times of Change

Participants → 113/175 = 65%:
1. Educators
2. Researchers
3. Clinical system leaders
4. Hospital system administrators
5. Clinical providers
6. Students
7. Residents/fellows

Institutions:
1. A.T. Still University SOM
2. U. of Colorado SOM
3. U. of Nebraska SOM
4. Sidney Kimmel Med. College/TJU
5. Penn State COM

Methods:
- Data obtained from electronic surveys
- Exploratory qualitative design
- Thematic analysis approach
- Constant comparative analysis

Research Aim: To explore the current AHC landscape with the goal of identifying barriers and opportunities for productive tripartite mission alignment (i.e. an evolving AHC identity)

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"Tripartite missions...three different lines of endeavor that act synergistically to advance a unified purpose – that of a healthier future for all." (Rahn)

Two Key Findings

1. Co-production and co-creation is required

2. There are unifying concepts to use as a roadmap
   - Patient psychosocial factors, behavior, and engagement
   - Healthcare delivery and coordination
   - Healthcare policy and economics
   - Community health (needs, assessments)
   - Social determinants of health
   - Population health and healthcare disparities
   - High-value care (including cost effectiveness)
   - Clinical informatics and technology
   - Operational excellence and improvement science
   - Translational and implementation science
The Evolving Academic Health Center Identity

Health Systems Science Vision
- Patient psychosocial and behavioral engagement
- Health care delivery and coordination
- Healthcare policy and economics
- Community health (needs, assessments)
- Social determinants of health
- Population health and healthcare disparities
- High-value care (including cost effectiveness)
- Clinical informatics and technology
- Operational excellence and improvement science
- Translational and implementation science
Upon completion of this session, participants will be able to:

1. Define health systems science – our 4th pillar of medical education at PSCOM,
2. Articulate the significant events that have contributed to the development of health systems science,
3. Highlight several health systems science curricula that have been implemented at PSCOM across the education continuum,
4. Discuss an evolving identity of academic health centers and how health systems science is contributing to this change.
The Oslerian “Triple Threat” Faculty Member

“Excellence of American Medicine is associated with a healthcare system that inherently values the coexistence of research, teaching, and clinical care within a single faculty.”

![Pie charts comparing professional effort distribution 15 years ago and today](chart.png)