

Health Systems Science (HSS): The Clerkship Years in Medical School

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Session 3 Webinar Learning Objectives

1. To explore the ways in which HSS can be integrated into clinical clerkships
2. To identify the use of HSS within clerkship evaluations
3. To recognize how SOAP-(V)alue integrates clinical reasoning and value- based care at the bedside
4. To describe the impact SOAP- V had on medical students in the clinical clerkship years



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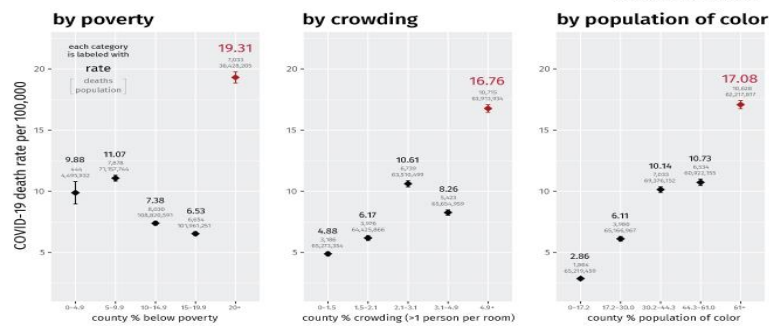
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The Harvard Center for Population
and Development Studies

Inequities in US COVID-19 Deaths

(as of April 16, 2020)



**people living in the most disadvantaged counties
have the highest COVID-19 death rates**

Source: Chen JT, Krieger N. Revealing the unequal burden of COVID-19 by income, race/ethnicity, and household crowding: US county vs ZIP code analyses. *Harvard Center for Population and Development Studies Working Paper Series*, Volume 19, Number 1, April 21, 2020. <https://tinyurl.com/yaw4we2r>



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Health Systems Science, Skochelak, SE, Hammoud, M, Lomis, K et al, Second Edition, Elsevier, 2021

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1. **Health Systems Science Curriculum at CWRU SOM**
2. **HSS Assessment**
3. **HSS in Clerkships- SOAP- V**

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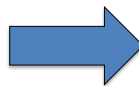
CWRU SOM Curriculum Team!!!



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Basic, Clinical and Systems Science



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Health Systems Science Integration

- Longitudinal, developmental curriculum
- How to improve health care quality, increase the value of care provided, enhance patient safety, deliver population-based medical care and work collaboratively in teams.
- How to advocate for patients and communities and recognize the socio-ecological determinants of health, health care policy and health care economics.
- Demonstrate Systems Based Competency
- Development of Change Agents

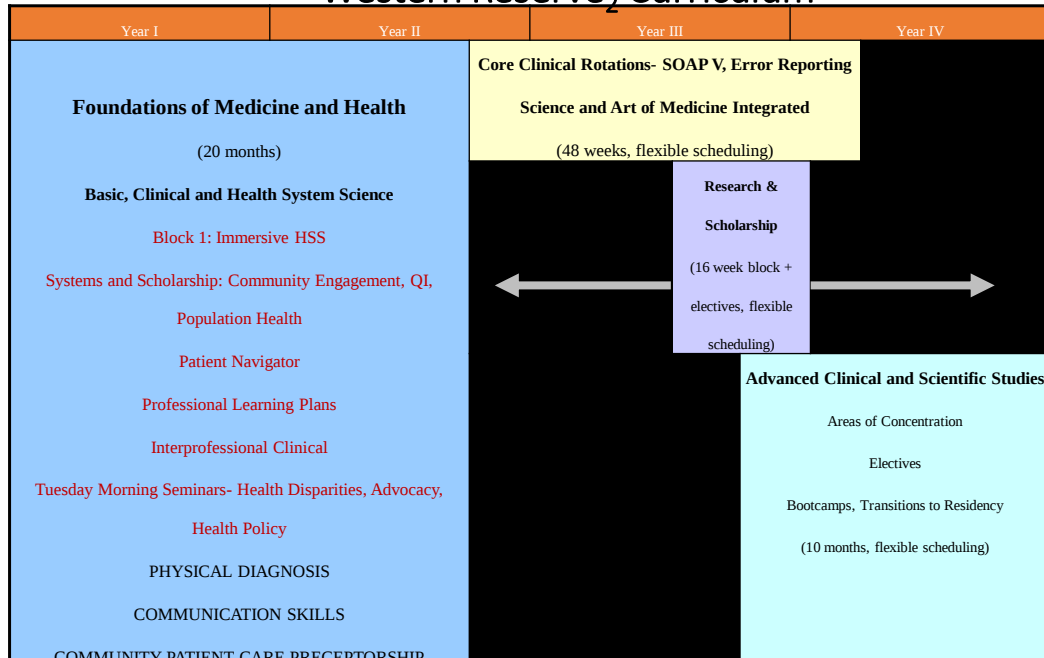
Health Systems Science

~~“ We are only as good as we diagnose”~~



“We are only as good as the care we deliver”

Western Reserve₂ Curriculum



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Block 1 Weekly Themes

		IQ Case	Unnatural Causes	Community Field Experiences	Team-Based Learning	Other Experiences
Week 1	Population Health		In Sickness and in Wealth; Not Just a Paycheck			Pandemic Flu
Week 2	Determinants of Health	Toni Jackson: Determinants of Health	When the Bough Breaks; Place Matters	Determinants of Health/Social Work	Population Health	Poverty Simulation
Week 3	Health Systems	Mr. Prince: Medical Error	Collateral Damage; Becoming American	Health System/Safety Net	Global Health System Comparisons	Poverty Simulation
Week 4	Patient-centered care	Mrs. Sanchez: Diabetes Mellitus	Bad Sugar	Chronic Conditions		Poverty Simulation
Week 5	"Bringing It All Together"	Jack Lee: Well Adult Care				

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Systems & Scholarship

A longitudinal curriculum in Year 1 and 2 which enables students to apply QI, Population Health and Research skills to ensure patient care meets the Institute of Medicine's 6 quality domains: safety, patient centeredness, equitable, efficient, timely and effective.



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CWRU School of Medicine University Track Early Years Curriculum



July Year 1				March Year 2			
Block 1 Becoming a Doctor (5 wk) (Public Health, Health Equity, QI/Patient Safety/Medical Error, Bioethics, Professionalism Epi/Biostats)	Block 2 The Human Blueprint (11 wk) <i>1 Week Clinical Immersion</i> (Endo, Repro, Development, Genetics, Mol Biol, Cancer Biology)	Block 3 Food to Fuel (11 wk) <i>1 Week Clinical Immersion</i> (GI, Nutrition, Energy, Metabolism, Biochemistry)	Block 4 Homeostasis (14 wk) <i>1 Week Clinical Immersion</i> (CV, Pulm, Renal, Cell Regulation, Pharmacology, Cell physiology)	Block 5 Host Defense and Host Response (14 wk) <i>1 Week Clinical Immersion</i> (Host Defense, Microbiology, Blood, Skin, Auto-immune)	Block 6 Cognition, Sensation, and Movement (14 wk) <i>1 Week Clinical Immersion</i> (Neuro, Mind Musculoskeletal, Cellular Neurophysiology)		
Block 7 Structure	Anatomy, Histology-Path, Radiology	→	→	→	→		
Block 8 Foundations of Clinical Medicine	Communications, PD, Patient Based Programs	→	→	→	→		
Systems & Scholarship	Community Engagement, Pop Health, QI, Research Skills	→	→	→	→		

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Students as “Change Agents”

“Active Participants” or “Co Producers” of Systems Improvement

- Organization of Health care delivery is changing and all graduates of medical schools will not be practicing in settings that are similar to where they trained.
- Unstable system in transition- how do we give the students tools to better prepare on how to deal with a changing health care system?



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PSNet
PATIENT SAFETY NETWORK

Perspectives on Safety Published February 1, 2019

Building Systems Citizenship in Health Professions Education: The Continued Call for Health Systems Science Curricula

By Jed D. Gonzales, MD, MSc, and Mantia K. Singh, MD, MSc

Perspective

We will never transform the prevailing system of an organization without transforming our prevailing system of education. They are the same system. (1) Edwards Deming

The Burning Platform for Change

The Institute of Medicine's 1999 (IOM) report, *To Err is Human: Building a Safer Health System*, revealed that more people die each year as a result of medical errors than from traffic accidents, breast cancer, or acquired immune deficiency syndrome. (2) These findings shocked health care into launching a movement to build safer and more reliable systems.

Nearly two decades later, slow and steady progress has been made, with reports suggesting improvements in some areas such as hospital-acquired infections. (3,4) However, the magnitude of improvement has not matched the need. Moreover, on top of these patient safety concerns, many studies have suggested the United States health care system falls short when compared to other nations on both patient safety and health equity.

Related Resources

- PERSPECTIVES ON SAFETY > INTERVIEW**
In Conversation With... Susan E. Bloche, MD, PhD
- PERSPECTIVES ON SAFETY > PERSPECTIVE**
Building a Safety Program in a Vast Health Care Network
Paul E. Pham, MD
- JOURNAL ARTICLE > STUDY**
Adverse medication events related to hospitalization in the United States: A comparison between adults with intellectual and developmental disabilities and those without
Erikson SH, Kessler N, Wu C-H. *American Journal on Intellectual and Developmental Disabilities*. 2019;123.
- PERSPECTIVES ON SAFETY > PERSPECTIVE**
Patient Safety and the Evolution of the IOM and PSNet
- JOURNAL ARTICLE > COMMENTARY**
Patient safety in the context of neonatal intensive care: research and educational opportunities.
Rao TK, Lorett E, Higgins RD. *Pediatric Research*. 2017;79:100-15.

[View More Related Resources](#)

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1. Health Systems Science Curriculum at CWRU SOM

2. HSS Assessment

3. HSS in Clerkships- SOAP- V



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HSS Assessment- Student and Curriculum

- **Year 1**
 - Block 1 evaluation
 - Summative Synthesis Essay Questions(SSEQs)
 - Professional Learning Plans (PLP)
 - Portfolios- Reflective Practice, Interprofessional Team Skills, Professionalism, Research Skills
- **Year 2**
 - QIKAT- R (pre and post curriculum)
 - Systems Thinking Tool
 - HSS NBME exam
 - PLP completion
 - Portfolios- Patient Care, Communications Skills
- **Year 3**
 - SAMI assessment- peer and facilitator
 - HSS NBME exam
 - Portfolio- Systems Based Practice and Personal and Professional Development

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Competency:Teamwork and Interprofessional Collaboration
Demonstrates knowledge and skills to promote effective teamwork and collaboration with health care professionals across a variety of settings

- Demonstrates effective teamwork and collaboration to improve patient care including transitions of care

Competency:Systems-based Practice
Demonstrates an understanding of and responsiveness to health care systems, as well as the ability to call effectively on resources to provide high value care

- Demonstrates understanding effects of health care systems on patient care
- Effective use of resources to provide high-value care including attention to patient safety

Competency:Reflective Practice
Demonstrates habits of ongoing reflection and analysis to both identify learning needs and

Competency:Research and Scholarship

Assessment Form 8/3/16, 9:04 PM

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Competency	Milestones at End of Block 4/ First Year	Milestones at Start of Clinical and Research Years	Milestones for the MD degree	Educational Program Objectives
Systems-based Practice Demonstrates an understanding of and responsiveness to health care systems, as well as the ability to call effectively on resources to provide high value care.	Compares and contrasts simple, complicated, and complex systems. Diagrams the contributions leading to medical errors in a given situation. Describes various organization, financing, and delivery systems of healthcare in local communities. Applies quality improvement methods in health promotion activities. Considers risks and benefits in proposing patient management plans.	Ability to identify and classify the different microsystems they work in. Describes the steps of a root cause analysis. Describes the impact of cost, insurance, and reimbursement on patients' ability to receive proper health care. Applies quality improvement methods to propose a plan to improve health care delivery for an individual patient (CPCP patient). Justifies choice of tests and treatment plans by considering inherent risks and benefits.	Identifies the impact of the specific health care delivery system on one's clinical decision-making. Uses a Root Cause Analysis to study errors within the healthcare system and propose changes to prevent similar errors. Considers economic and cultural factors, individual and family contributions and the availability of health care system resources in clinical decision-making. Applies quality improvement methods in the care of a patient to develop a plan to address specific behavior change. Accesses, critically appraises and utilizes biomedical information for making decisions that are relevant to the care of individuals and populations.	Applies knowledge of health care systems to patient care discussions. Demonstrates awareness of context of care, patients' values and health care system resources in clinical decision-making. Applies principles of quality improvement and safety to patient care.

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Systems-based Practice

Demonstrates an understanding of and responsiveness to health care systems, as well as the ability to call effectively on resources to provide high value care

Milestone: Considers economic and cultural factors, individual and family contributions and the availability of health care system resources in clinical decision making.

Prompt: Describe a specific patient scenario over the last year in which you (and your clinical team) took into consideration economic and cultural factors, individual and family contributions, and the availability of health care system resources when making a clinical decision? Reflect on how you think this impacted the patient's care and whether it helped or hindered care.



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1. Health Systems Science Curriculum at CWRU SOM
2. HSS Assessment
3. SOAP-Value



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SOAP-V: A New Pathway to High-Value Care

Clifford D. Packer, MD

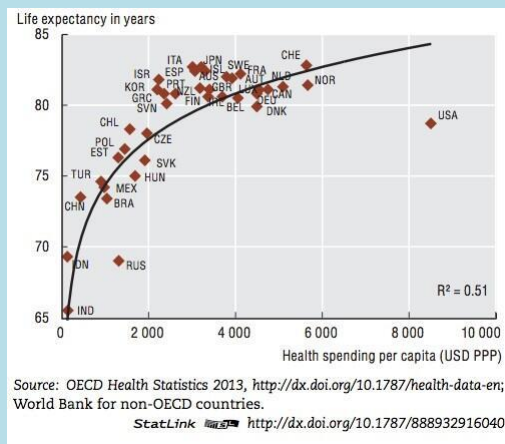
Louis Stokes Cleveland VA Medical Center

Professor of Medicine, Case Western Reserve University School of Medicine

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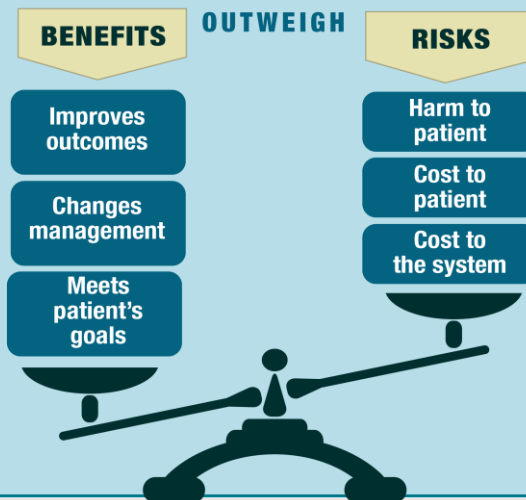


Life Expectancy v. Cost of Care



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A HIGH VALUE TEST OR TREATMENT IS WHEN



How do you incorporate value?

1. **Evidence of value:** Before ordering a test, have you and the team considered whether the result would **change management**? Before ordering a treatment, have you **considered the evidence** for the treatment vs. no treatment or an alternative treatment?

2. Patient values: Have you discussed with the patient their **goals and values**? Do they recognize the **potential harm** of the test/treatment compared to alternatives?

3. Relative cost: What is the **approximate cost** of the test/treatment? Are there less costly alternatives with similar benefits?

Where to get cost information

- Healthcarebluebook.com
- iTriage – a mobile app

SOAP-V Card

SOAP-V for presentations or notes

Subjective: focused history and review of systems for the day

Objective: vital signs, physical examination, results of diagnostic studies (labs, radiology, etc.)

Assessment: a summary of the patient along with a probable diagnosis for the current presentation

Plan: your proposed treatment for the patient, by problem, including ordering tests and treatments

VALUE: Justify the planned tests and treatments and consider alternatives. Ask yourself the following questions:

1. **Evidence of value:** Before ordering a test, have you and the team considered whether the result would change management? Before ordering a treatment, have you considered the evidence for the treatment vs. no treatment or an alternative treatment?
2. **Patient values:** Have you discussed with the patient their goals and values? Do they recognize the potential harm of the test/treatment compared to alternatives?
3. **Relative costs:** What is the approximate cost of the test/treatment? What are the downstream costs? Are there less costly alternatives with similar benefits?

Where to find cost information:
HealthCareBlueBook.com

Spending Patterns in Region of Residency Training and Subsequent Expenditures for Care Provided by Practicing Physicians for Medicare Beneficiaries JAMA 2014; 312(22):2385-93

- Among general internists and family physicians who completed residency training between 1992 and 2010, the spending patterns in the HRR in which their residency program was located were associated with expenditures for subsequent care they provided as practicing physicians for Medicare beneficiaries. Interventions during residency training may have the potential to help control future health care spending.

Implementation

- 3 medical schools (Penn State, Harvard-Beth Israel Deaconess, Case Western Reserve-Cleveland VA)
- American College of Physicians and Carl J. Shapiro Institute as partners
- Each school with intervention and control arm
 - Pre- and post- surveys on attitudes of medical students, residents and faculty
 - Measuring use of SOAP-V via email link and direct observation

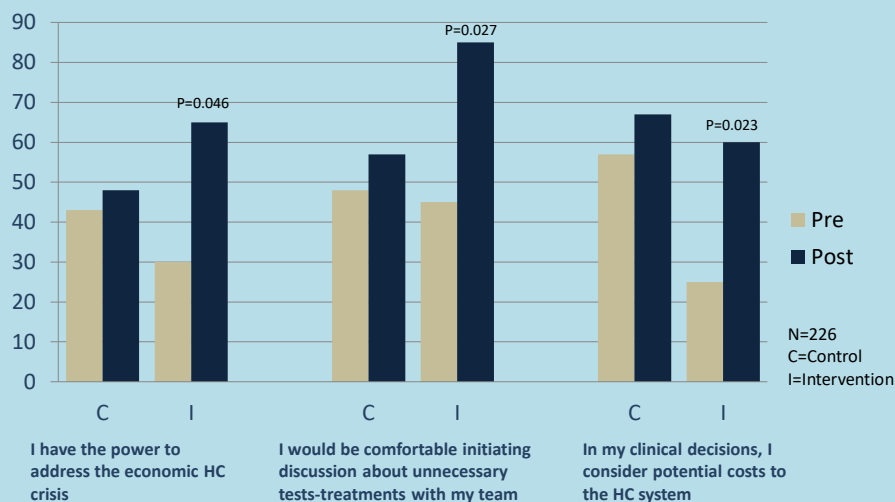
Methods

- **Nonrandomized controlled trial**, with half of the third-year students at each institution in the control arm and half in the intervention arm.
- **Before the clerkship both control and intervention students attended a 1-hour lecture on general principles of HVC. Students in the intervention group received an additional 1-hour SOAP-V training session, which included background on overuse and pressures faced by students on rounds to order unnecessary tests; introduction to the SOAP-V framework; a video of a student using SOAP-V on rounds; and role-play opportunities using SOAP-V in their presentations.**
- They received a pocket card, which referenced Healthcarebluebook.com, a website that displays health care costs by US geographic region.
- **We asked students to use the SOAP-V framework during inpatient rounds** and informed faculty and residents that students might incorporate elements of HVC into their discussions.
- **Students in intervention and control arms at each school were surveyed on their attitudes toward HVC at the beginning of the clerkship year (pre-intervention) and then again at the completion of the medicine clerkship and at 6 and 12 months, via a 19-item questionnaire soliciting perceptions and self reported practices in HVC.**

Moser et al. SOAP to SOAP-V: A new paradigm for teaching students high value care. Am J Med. 2017; 130(11):1331-1336.

- Medical students are well positioned to bring value discussions into patient care activities.
- Students at 3 medical schools used the SOAP-V framework during team presentations to apply high value care in their medical decision making.
- The intervention group reported higher self-efficacy toward addressing the economic health care crisis, initiating team discussions on unnecessary tests or treatments, and considering potential costs to patient and system; these changes were not present in the control group.

6-Month Data: % Somewhat or Completely Agree



RESULTS OF THEMATIC ANALYSIS OF FOCUS GROUPS

Am J Med. 2017; 130(11): 1331-1336.

SOAP-V served as a generalizable tool across clinical experiences

- "I had medicine first and I had it on my mind the rest of the year. When the discussions came up I had that added context."
- "If we can start having the health systems conversation talk much earlier on in our training, then you kind of switch your mindset and say, 'Okay, this is something important.'"
- "It definitely influenced me in the outpatient setting. I started to be more conscious of it and I would take into account not only guidelines, but would it change our management?"

SOAP-V emphasized topics like cost and patient harm that were usually avoided

- "I just didn't think we did a good enough job of informing the patients about why we were doing the tests we were. Most of the discussions that we had about value were in the hallway, not in the patient's room."
- "(The system) lacks a finite idea of what this cost is. It's almost like having a credit card with an unlimited amount of money. You never know how much you're spending because you don't have a definitive statement of what's going on."

SOAP-V facilitated value conversations

- "[A value-based question] would prompt either the intern or the resident to ask the same question."

How to talk about high value care

- Don't hesitate or apologize when it comes to bringing up cost issues on rounds. These days, everybody is aware of the importance of high value care, and the best attendings and residents are already talking about it and teaching it.
- You don't need to discuss all three components of high value care in every presentation. A simple comment about the patient's preferences, the cost of a test, or the questionable utility of a procedure is often enough to get the value discussion going.
- Cite guidelines, randomized trials, and other evidence to support your thinking about the proposed test or procedure.
- *Embed the discussion of value in your assessment and plan.*

An example: meniscal tear

- The patient is a 59-year-old woman with a left knee meniscal tear diagnosed by MRI last week. The MRI also revealed moderate osteoarthritis. She's having moderate pain with walking, mild swelling, and occasional locking of the knee. Her health insurance has a high deductible, and she would prefer to avoid surgery if possible. The cost of a knee arthroscopy is \$3000-\$5000 and the cost of a full course of physical therapy would be \$1000-2000. A randomized controlled trial of patients 45 and over with meniscal tear and mild-to-moderate arthritis showed similar results at 6 and 12 months with surgery or physical therapy. I think that physical therapy would be a reasonable approach for her, and it would be in keeping with her preference to avoid surgery. We could offer her a corticosteroid knee injection today to reduce the pain and swelling and help her to tolerate the physical therapy.

SOAP-V Publications

- Moser EM, Huang G, Packer CD, Glod S, Smith CD, Alguire PC, Fazio S. SOAP-V: Introducing a method to empower medical students as change agents in bending the cost curve. J Hosp Med. 2016; 11(3):217-220.
- Moser EM, Fazio S, Packer CD, Glod S, Smith CD, Alguire PC, Huang GC. SOAP to SOAP-V: A new paradigm for teaching students high value care. Am J Med. 2017; 130(11):1331-1336.
- Packer C.D. (2019) Adding Value to the Oral Presentation. In: Presenting Your Case. Springer, Cham.

Medical Schools Now Using SOAP-V

- Case Western Reserve University
- Harvard
- Penn State
- Albany
- Mayo Clinic
- Illinois-Chicago
- Dell (Austin, Texas)
- University of Minnesota
- Geisel School of Medicine
- UCSF
- University of South Carolina

Next steps and conclusion

- We received a \$25,000 ABIM grant to expand SOAP-V to resident ambulatory clinics at Cleveland VA and Penn State. Research is ongoing.
- We partnered with the Cleveland Institute of Art animation department to develop a 4-minute animated SOAP-V video
<https://www.youtube.com/watch?v=3PLHpx1Kilw>

SOAP-V Collaborators

- Harvard/Beth Israel Deaconess: Sara Fazio, Grace Huang
- Cleveland VA: Clifford Packer
- Penn State: Eileen Moser, Sue Glod
- Shapiro Institute: Grace Huang, Richard Schwartzstein
- American College of Physicians: Patrick Alguire, Daisy Smith
- AAIM/CDIM: Sara Fazio, Valerie Lang

High Value Care Tools

- Online HVC Cases
https://hvc.acponline.org/physres_cases.html
- Simple cases on HVC
<http://www.med-u.org/simple#>
- Choosing Wisely lists
<http://www.abimfoundation.org/Initiatives/Choosing-Wisely.aspx>

References (cont'd)

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- Leenstra, James L et al. “Validation of a method for assessing resident physicians' quality improvement proposals.” *Journal of general internal medicine* vol. 22,9 (2007): 1330-4. doi:10.1007/s11606-007-0260-y
- Dolansky MA, Moore SM, Palmieri PA, Singh MK. Development and Validation of the Systems Thinking Scale [published online ahead of print, 2020 Apr 27]. *J Gen Intern Med.* 2020;10.1007/s11606-020-05830-1. doi:10.1007/s11606-020-05830-1
- Singh, MK; Ogrinc G, Cox, K et al, The Quality Improvement Knowledge Application Tool Revised (QIKAT-R)", *Academic Medicine*, 2014 Oct;89(10):1386-91
- Taking the Lead on Health Care Quality Improvement- MOOC,, Dolansky, MA; Singh, MK; Moore, S; 2015 <https://www.coursera.org/learn/hcqualityimprovement>



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