Health Systems Science: The Pre-Clerkship Years of Medical School

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Adrienne Green MD
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IAMSE March 2020

Objectives:

By the end of this seminar, we hope you will be able to:

1. Identify the importance of health systems science in medical student education
2. Describe one sample strategy for integrating health systems science with basic and clinical sciences in pre-clinical undergraduate medical education
3. List benefits of value-added student roles from the perspectives of a health system

Today's Session in Three Parts

1. What is health systems science and why is it important to medical education?
   - **Dr. Edgar Pierluissi, Director of Health Systems Improvement, UCSF School of Medicine**

2. How do we teach health systems science in the pre-clerkship years?
   - **Dr. Anna Chang, Director of Clinical Microsystems Clerkship, UCSF School of Medicine**

3. Why do academic health centers want health systems science education?
   - **Dr. Adrienne Green, Chief Medical Officer, UCSF Health**

Preview: Take Home Points

Because of the gaps in our health care systems, today's medical educators need to add health systems science early in undergraduate medical education.

- Dr. Pierluissi

There are models to integrate health systems science into classroom and experiential learning in the first two years of medical school for early students.

- Dr. Chang

Academic health system leaders perceive an alignment and value in having early medical students engaged in health systems improvement

- Dr. Green

What is Health Systems Science &

Why is it Important to Medical Education?

Edgar Pierluissi MD
Director
Health Systems Improvement
Clinical Microsystems Clerkship
UCSF School of Medicine

Definition

Health systems science is the study of how health care is delivered.
It seeks to improve the quality of health care
for patients and populations.

- American Medical Association

Medical Education Consensus

Clinical Review & Education

Special Communication

Medical Education
Part of the Problem and Part of the Solution

Catherine Reinis Lucey, MD

Perspective

Medical Education and Health Care Delivery: A Call to Better Align Goals and Purposes

David P. Sklar, MD, Paul A. Hemmer, MD, MPH, and Steven J. Durning, MD, PhD

VIEWPOINT

Transforming From Centers of Learning to Learning Health Systems
The Challenge for Academic Health Centers

Kevin Grumbach, MD
Department of Family and Community Medicine, University of

Health care organizations face intensifying pressure to achieve the triple aims of better patient experience, better health, and affordability. Although all health systems grapple with these imperatives, the tripartite mis-

nities who voice concern that clinical operations already do not adequately accommodate the other academic missions. They are apprehensive that the clinical enterprise's heightened attention to customer

Opinion

Value-Added Medical Education: Engaging Future Doctors to Transform Health Care Delivery Today

Steven Y. Lin, MD[1], Erika Schillinger, MD[2], and David M. Irby, PhD[3]

Teaching Systems Improvement to Early Medical Students: Strategies and Lessons Learned

Monica W. Harbell, MD, Descartes Li, MD, Christy Boscardin, PhD, Edgar Pierluissi, MD, and Karen E. Hauer, MD, PhD

Preparing Medical Students to Improve Health Care

Preparing Medical Students for the Continual Improvement of Health and Health Care: Abraham Flexner and the New "Public Interest"

Donald M. Berwick, MD, MPP, and Jonathan A. Finkelstein, MD, MPH

TRAINING TOMORROW'S DOCTORS

The Medical Education Mission of Academic Health Centers

A Report of The Commonwealth Fund Task Force on Academic Health Centers

April 2002

Article

American College of Medical Quality

Validity of the Health Systems Science Examination: Relationship Between Examinee Performance and Time of Training

American Journal of Medical Quality
2020, Vol. 35(1) 63–69

DOI: 10.1177/1062860619853349
ajmq.sagepub.com
SAGE

Michael Dekhtyar, BA[1], Linette P. Ross, MA[2], Jean D'Angelo, BA[2], Jeanne Guernsey, MA[2], Karen E. Hauer, MD, PhD[3], Luan Lawson, MD, MAEd[4], Martin V. Pusic, MD, PhD[5], and Richard E. Hawkins, MD[1,6]

Health Systems Science: The "Broccoli" of Undergraduate Medical Education

Jed D. Gonzalo, MD, MSc, and Greg Ogrinc, MD, MS

Drivers for Health Systems Science in Medical Student Education

1. Quality
2. Patient Complexity
3. Cost

Why Health Systems Science?

1. Quality of Care Problem

There are many areas where American medicine doesn't deliver care that we know can be achieved, although there are some areas of excellence.

Every system is perfectly designed to get the results it gets.

We've tried NOT incorporating this competency in medical education..

Why Health Systems Science?

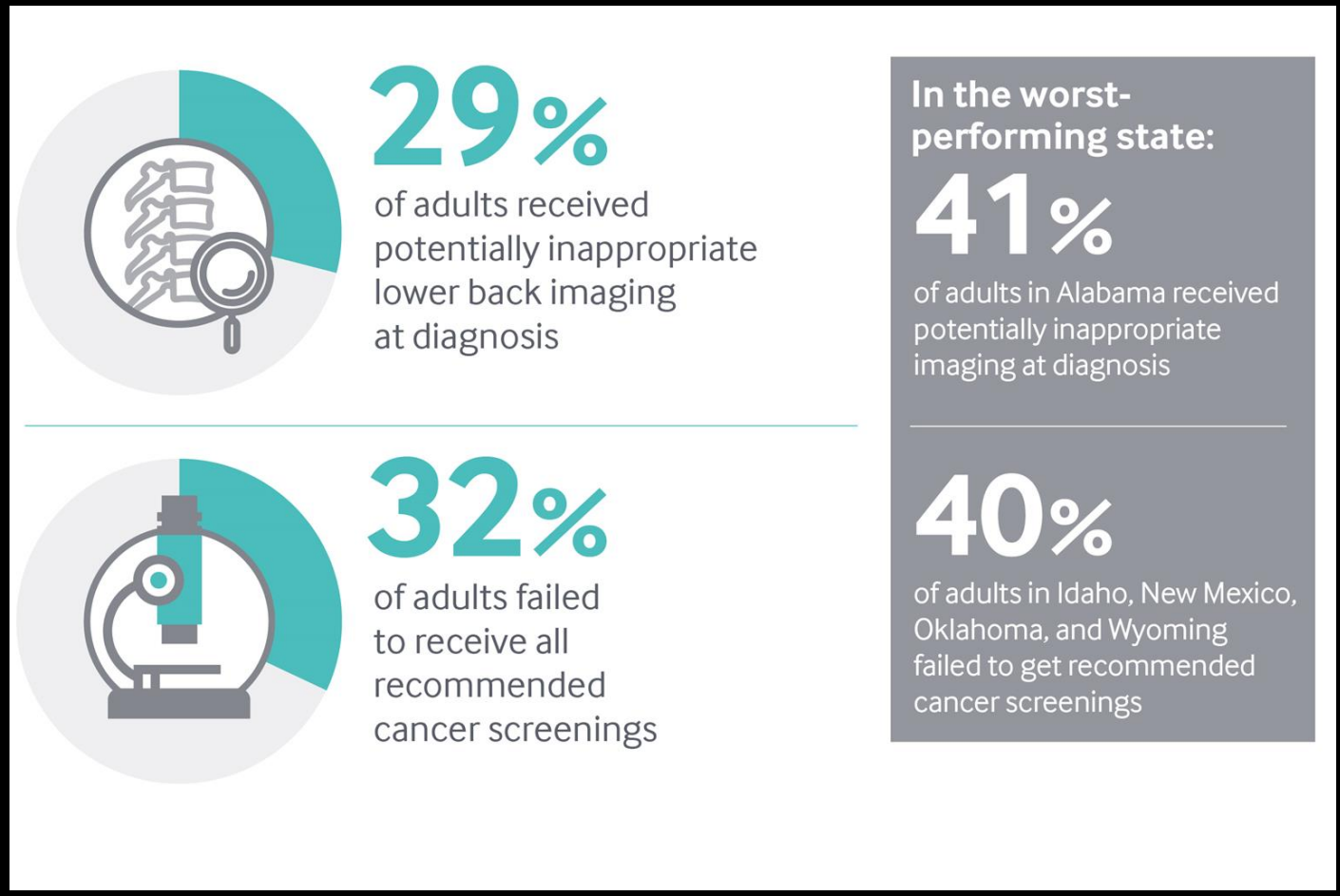
Quality

Of 11 wealthy countries, USA ranked:

- Clinical Outcomes (30d stroke, MI mortality) 1st
- Access 6th
- Perceptions of care 10th
- Life Expectancy 11th
- Disparities in Health Care

JAMA. 2018;319(10):1024-1039

There are significant gaps in health care quality across the U.S.



Overuse

Underuse

Source: David C. Radley, Douglas McCarthy, and Susan L. Hayes, *2018 Scorecard on State Health System Performance* (The Commonwealth Fund, May 2018).

Why Health Systems Science?

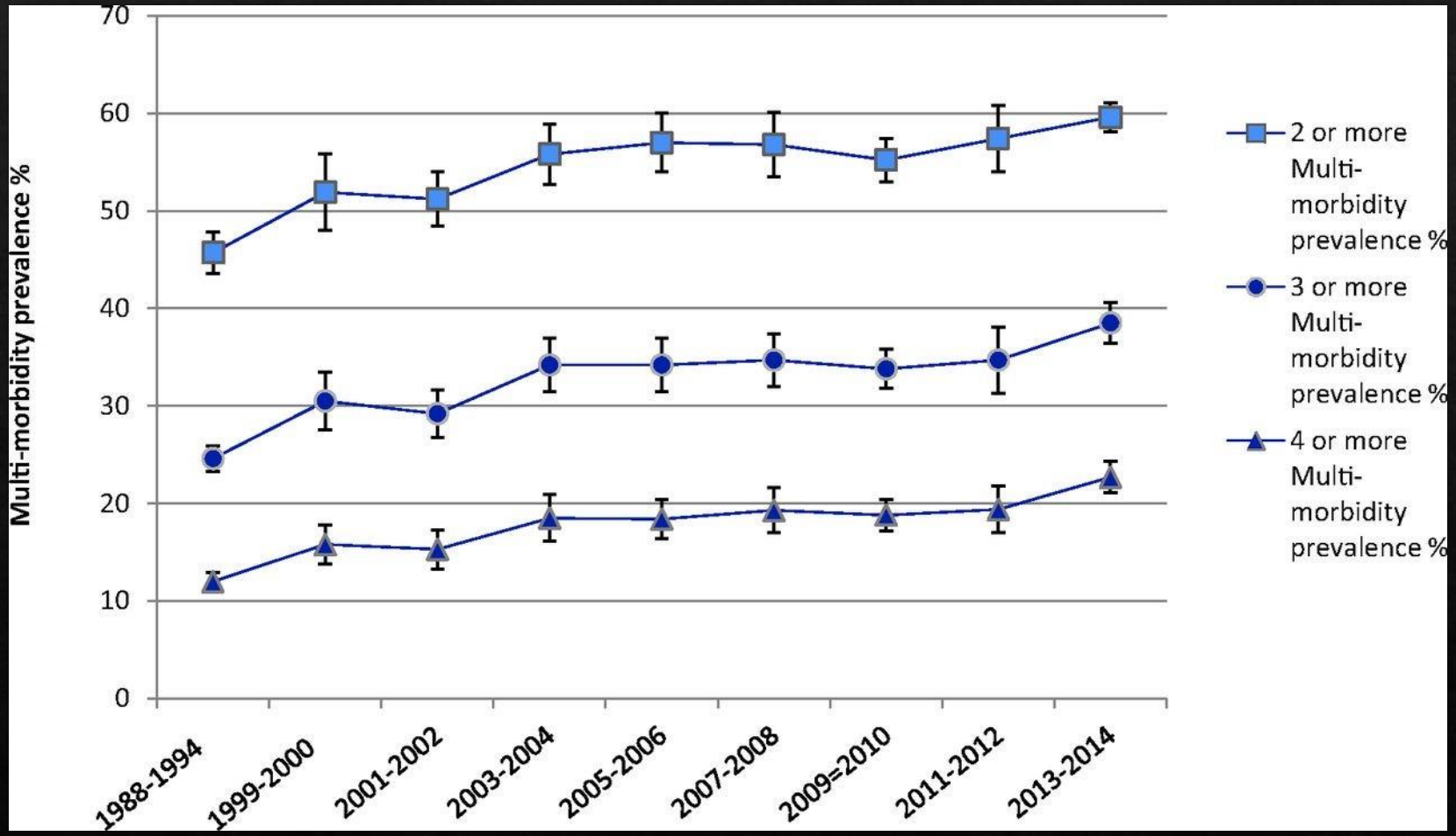
2. Patient Complexity Problem

The number of patients with complex medical and psychosocial factors is increasing.

These patients disproportionately account for

poor health outcomes and health care costs.

High Burden of Disease



Age-standardized trends in multi-morbidity prevalence for participants 20 years or older from NHANES 1988–2014 by number of comorbidities

J Amer Board of Fam Med 2018

Patient Complexity Problem

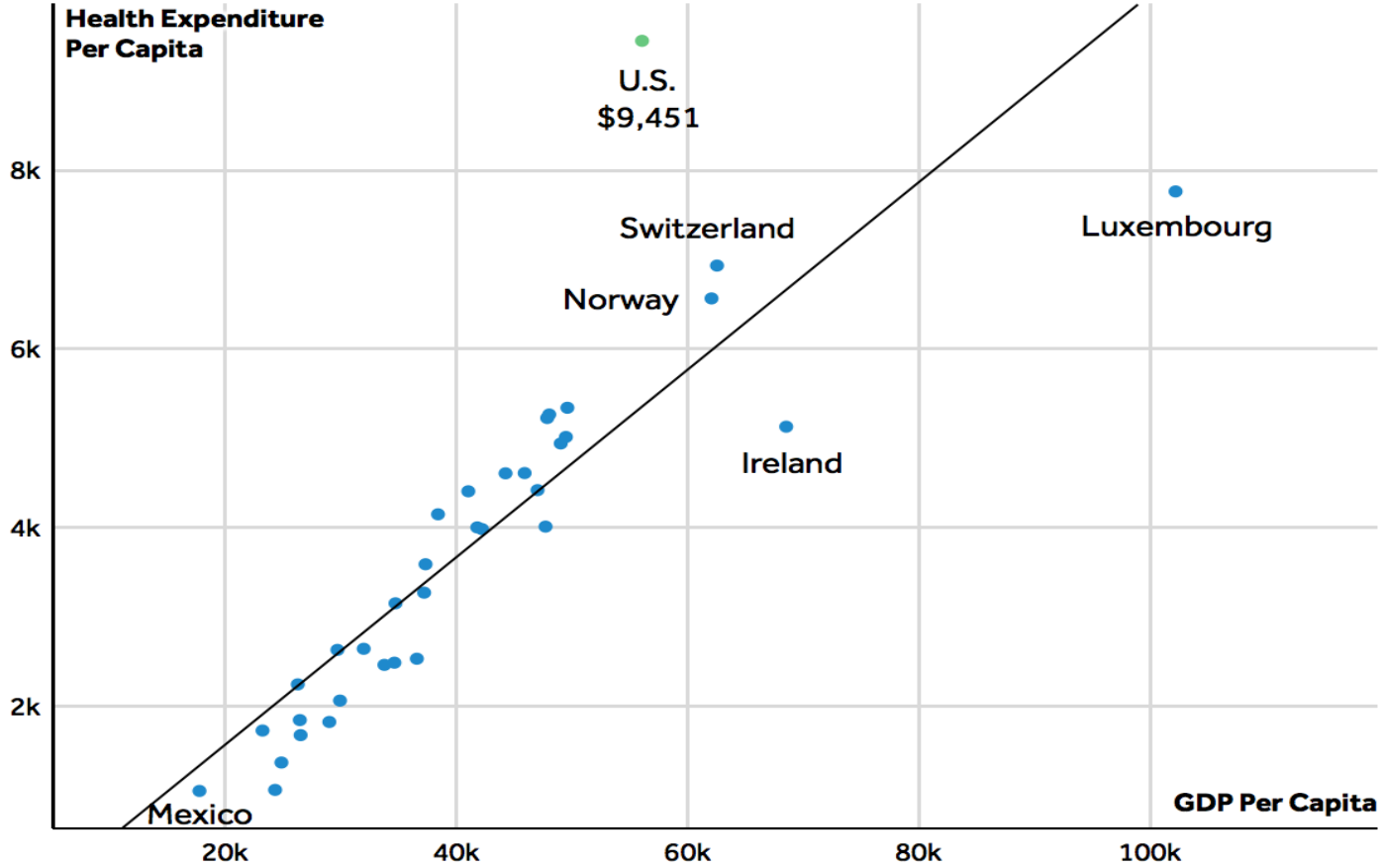
As the number of patients with multimorbid, complex, medical and psychosocial factors increase, health outcomes will depend more on teams and systems of care than the individual physician.

Why Health Systems Science?

3. Cost Problem

The US spends more, by far, on health care than other wealthy countries.

Total health expenditures per capita/GDP per capita, U.S. dollars, PPP adjusted, 2015



Health expenditures are estimated values. GDP for Australia, Japan, Mexico, New Zealand, Poland, Portugal, and United Kingdom are estimated values.

Source: Kaiser Family Foundation analysis of data from OECD (2017), "OECD Health Data: Health expenditure and financing: Health expenditure indicators", OECD Health Statistics (database). DOI: 10.1787/health-data-en (Accessed on March 19, 2017).

Peterson-Kaiser Health System Tracker

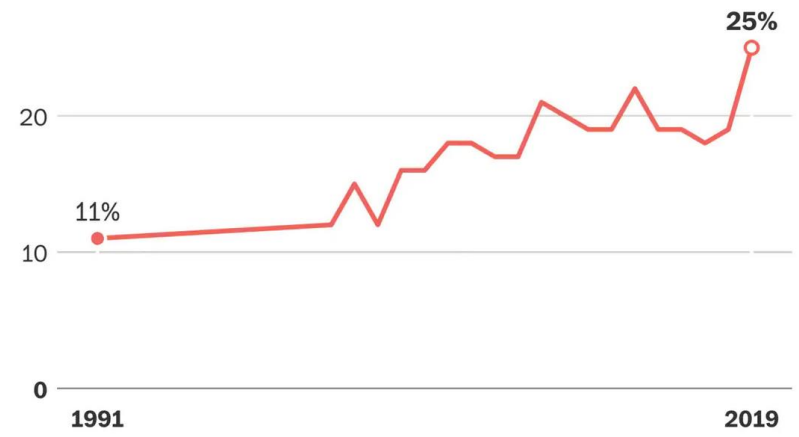
“The greatest threat to America’s fiscal health is not Social Security….By a wide margin, the biggest threat to our nation’s balance sheet is the skyrocketing cost of health care. It’s not even close.”

President Barack Obama

March 2009

Record share of Americans delay treatment due to cost

Percent saying they or a family member put off care for a serious medical condition "because of the cost you would have to pay"



Source: Gallup

THE WASHINGTON POST

A stunning indictment of the U.S. health-care system, in one chart

Americans are putting off medical treatment in record numbers because of cost, Gallup data shows

The Washington Post
Dec. 10, 2019

Cost problem

Adhering to evidence, aligning care with patients' values,
increasing collaboration and care
has the potential to reduce waste.

Drivers for Health Systems Science in Medical Student Education

1. Quality
2. Patient Complexity
3. Cost

How do we Teach Health Systems Science in the Pre-Clerkship Years?

Anna Chang MD
Director
Clinical Microsystems Clerkship
UCSF School of Medicine

Concerns for Integrating Health Systems Science

- Pre-clerkship medical students… Is it too early?
  - Not too early
- The medical student curriculum is already packed. Where to put this?
  - Re-envisioning, integration, and change management
- Faculty never learned this. Who will teach it?
  - Co-learning and expansion of concept of "educator"
- Health systems are still working to improve. How can they partner to teach students?
  - Let's improve together!

Gonzalo et al. Academic Medicine 2018 and 2019

Health Systems Experiential Learning Models

- Patient navigators (for individual patients)
- Medical scribes (for individual clinicians)
- Patient population health managers (for groups of patients)
- Quality improvement team members (for health systems)

Gonzalo et al. Academic Medicine 2017
Brown et al. BMJ Quality/Safety 2018

Curriculum Transformation at UCSF

Medical Students Start New Bridges Curriculum

Original Post Date: 07/28/2016 Printer-friendly version

Students gather for the 2016 White Coat Ceremony.
Photo: Elisabeth Fall

By Mitzi Baker

The new School of Medicine Bridges curriculum is considered the most innovative training currently offered at a medical school in the country. Immersed in clinical teams from the start, Bridges students will be trained to continuously improve care. Their understanding of the foundational sciences will be in sync with what they are learning in active clinical settings. They will be challenged to ask questions that advance not just their understanding of human health and disease but the very frontiers of science.

UCSF University of California San Francisco About UCSF

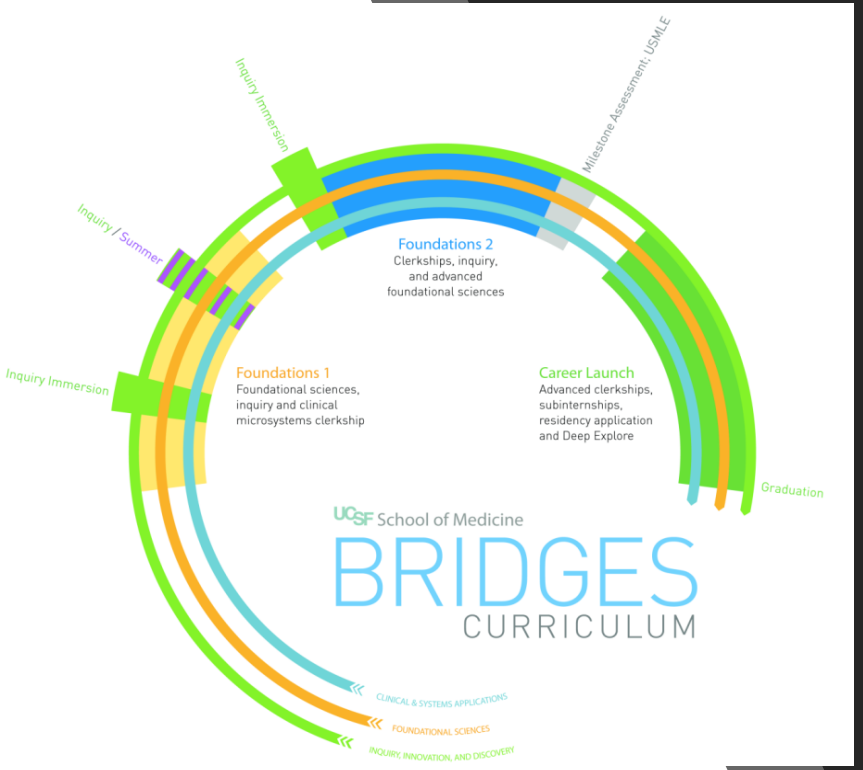
PharmD Curriculum Transformation Project

2018 and beyond

The curriculum for 2018 and beyond will prepare graduates to be critical thinkers and problem solvers who will lead the way in today's dynamic health care environment, toward better health for all.

Lucey CR. JAMA IM 2013

UCSF School of Medicine Bridges Curriculum



- ***Foundations 1 (Years 1 and 2)**
  - Foundational Sciences, Clinical Microsystems Clerkship, Inquiry, Assessment, Reflection, Coaching and Health Weeks
- **Foundations 2 (Year 3)**
  - Core and elective clerkships, USMLE Steps 1 & 2
- **Career Launch (Year 4)**
  - Advanced clerkships and sub-internships, deep explore

The UCSF Pre-Clerkship Curricular Calendar

- *Clinical Microsystems Clerkship (longitudinal)
- Inquiry (longitudinal)
- Foundational Science Blocks
  - Ground School
  - Airway, Blood, Circulation
  - *Health and the Individual
  - Renal Endocrine, GI, and Nutrition
  - *Health and Society
  - Pathogens and Host Defenses
  - Life Stages
  - Brain, Movement, and Behavior
  - *Diagnostic Reasoning

Quarter	Date		Year 1 Class of 2023	Date		Year 2 Class of 2023
Summer 2 Q	8/5/19	1	Launch	8/3/20	8	Vacation/Inquiry
	8/12/19	1	CIC IDS 121A Ground School CMC	8/10/20	9	
	8/19/19	2		8/17/20	1	CIC IDS 122A Life Stages CMC
	8/26/19	3		8/24/20	2	
	9/2/19	4		8/31/20	3	
	9/9/19	5		9/7/20	4	
Fall Q	9/16/19	1	IDS 121A ARCH 1	9/14/20	5	
	9/23/19	1	CIC IDS 121B ABC 1 CMC	9/21/20	6	
	9/30/19	2		9/28/20	7	
	10/7/19	3		10/5/20	1	CIC IDS 122B BMB CMC
	10/14/19	4		10/12/20	2	
	10/21/19	5		10/19/20	3	
	10/28/19	1	CIC IDS 121B H&I CMC	10/26/20	4	
	11/4/19	2		11/2/20	5	
	11/11/19	3		11/9/20	6	
	11/18/19	1	CIC IDS 121B ABC 2 CMC	11/16/20	7	
	11/25/19	2		11/23/20	1	IDS 122B ARCH 4
	12/2/19	3		11/30/20	1	Vacation
	12/9/19	4		12/7/20	1	
	12/16/19	1	IDS 121B ARCH 2	12/14/20	2	CIC IDS 122C DR CMC
	12/23/19	1	Winter Break	12/21/20	3	
	12/30/19	2		12/28/20	1	Winter Break
Winter Q	1/6/20	1	IDS 123A Inquiry Immersion	1/4/21	2	
	1/13/20	2		1/11/21	1	
	1/20/20	1	CIC IDS 121C REGN CMC	1/18/21	2	Foundations 2: Block 1 Longitudinal FCM 110/IDS 113 FS-in-F2
	1/27/20	2		1/25/21	3	
	2/3/20	3		2/1/21	4	
	2/10/20	4		2/8/21	5	
	2/17/20	5		2/15/21	6	
	2/24/20	6		2/22/21	7	
	3/2/20	7		3/1/21	8	
	3/9/20	8		3/8/21	1	
	3/16/20	1	CIC IDS 121C H&S CMC	3/15/21	2	Foundations 2: Block 2
	3/23/20	2		3/22/21	3	
	3/30/20	3		3/29/21	4	
Spring Q	4/6/20	1	IDS 121C ARCH 3	4/5/21	5	
	4/13/20	1	Vacation	4/12/21	6	
	4/20/20	1	CIC IDS 121D CMC	4/19/21	7	
	4/27/20	2		4/26/21	8	
	5/4/20	3		5/3/21	1	IDS 117A ARCH 5
	5/11/20	4		5/10/21	1	

Health Systems Improvement

Interprofessional Collaboration

Direct Patient Care

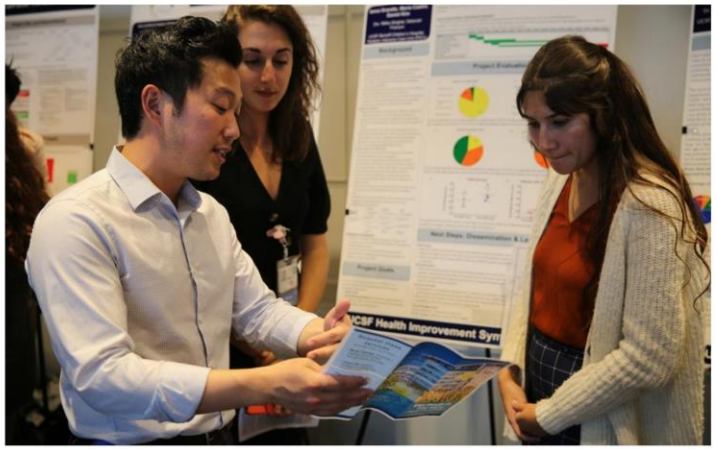
Clinical Microsystems Clerkship for MS1 and MS2s

Can Early Students Add Value to Patients and Health Systems…?

First and Second-Year Med Students Help Solve Critical Health Care Problems

Third Annual Clinical Microsystem Clerkship Symposium Showcases Quality Improvement Projects

December 02, 2019 | By Rebecca Wolfson



Medical students (from left) Daniel Kim, Anna Grandis and Maria Castro display their clinical microsystem clerkship project at a symposium on Nov. 18, 2019.

On November 18, medical students showcased quality improvement projects completed as part of their Clinical Microsystems Clerkship (CMC). This program involves 16 months of immersion in an inter-professional, team-based clinical environment, where they learn clinical skills and complete a longitudinal health systems improvement project to address urgent health care challenges.

"This training was built around the need for physicians to be just as well-versed in the systems of care as they are in direct patient care skills," said UCSF School of Medicine Dean Talmadge E. King, Jr, MD. "I have no doubt that this program will be seen as a critical turning point for the betterment of American medical education."

In 51 projects across three major UCSF affiliated clinical sites 152 students contributed more than 10,000 hours of effort over the past 16 months.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MORE NEWS

For Health Systems Science

Each year since 2016,

150 first- and second-year medical students

Start with 20 hours of lectures and workshops and then

Spend one day per week for 28 weeks in

Three health systems with

25 physician coaches who began preparing projects 6 months in advance

Improving quality, safety, experience, value, and outcomes.

UCSF
University of California
San Francisco

UCSF Medical Student Coaching Program

- 55 physician coaches
- 20% FTE
- 6 students, alternating years
- Coaching, advising, teaching clinical skills, and guiding health systems improvement projects

Preparing for Health Systems Science

FACULTY DEVELOPMENT

LECTURES AND SMALL GROUPS

PROJECTS APPLYING LEAN

In 2019, 51 projects across 16 specialties, three major UCSF affiliated clinical sites

152 students contributed more than 10,000 hours of effort over 16 months.

All involved multiple health professions, half involved patients.

72% projects improved microsystem

86% students achieved learning goals

A Student-Run Outreach and Vaccine Administration Clinic Provides Longitudinal Workplace-Based Learning and Improves Patient Care

Alexander F. Haddad*, Lillian Lai*, Jason Parad*, Lakshmipriya Subbaraj*, Sarah W. Takimoto*, Tenessa MacKenzie MD

University of California, San Francisco School of Medicine
UCSF Family Medicine at Lakeshore
*These authors contributed equally to this work.

BACKGROUND

- UCSF School of Medicine's new educational curriculum features the clinical microsystem clerkship (CMC), which groups first-year students into teams of 5-6 to learn systems quality improvement and clinical skills through a longitudinal workplace-based experience.
- Five students assigned to UCSF Family Medicine at Lakeshore piloted and refined a student-run vaccination clinic by implementing Plan-Do-Study-Act (PDSA) cycles.
- The clinic provided the opportunity to meaningfully increase influenza vaccination uptake and progress toward mastery in all UCSF MD graduation competencies.*

Patient Care	Professionalism
Medical Knowledge	Systems-Based Practice
Practice-based Learning & Improvement	Interprofessional Collaboration
Interpersonal & Communication Skills	

*Based on competencies adopted by the Accreditation Council for Graduate Medical Education

METHODS

Administrative Preparation

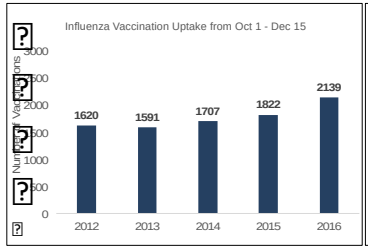
A faculty physician at Lakeshore worked with UCSF leadership to approve the clinic and student training process. Students were trained in vaccination administration by reviewing CDC online vaccine modules, completing a UCSF nursing vaccine administration certificate course, and receiving hands-on training and initial supervision from nursing and physician staff.

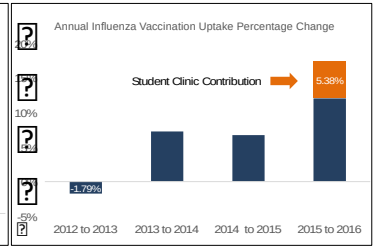
Daily Activities

The clinic ran for 3 hours each week during influenza season. For each patient visit, students reviewed the electronic medical record and checked for health maintenance notifications. They then administered the recommended vaccines and addressed additional patient concerns. Students also attended to clinic workflow and conducted PDSA cycles for continual improvement.

QUALITY IMPROVEMENT

Date	Plan	Do	Study	Act
Problem: Not knowing when patients arrive leads to inefficient visits				
10/13/16	Design method to indicate patient arrival	Adapt current patient flow notification "dot" system at Lakeshore to electronic vaccine clinic schedule	Accurate dots improved workflow efficiency	Adopt
Problem: Pre-ordering vaccines for all scheduled patients results in open encounters for no-show patients				
10/20/16	Implement system to reduce time wasted on ordering and canceling unnecessary vaccines	Write order only upon patient arrival	Eliminated unnecessary opening and closing of patient encounters	Adopt
Problem: Additional coordination needed between students and attending physician				
10/20/16	Adapt dot system to note ongoing status of patient encounter	Implement color-coded dot system ● = patient arrived ● = order signed ○ = encounter ready for attending to close	Allowed for faster closing of encounters	Adopt
Problem: Lack of data on patient vaccination habits may hinder optimal clinic programming				
10/27/16	Formulate questions to ask patients about their vaccination habits	Use smartphrase: " .lkscmcvaccine" to prompt standardized list of questions on EMR	Smartphrase elucidated patient habits, which confirmed value of vaccination clinic within family medicine practice	Adopt
Problem: Confusion over student-patient pairings				
10/27/16	Create system to track student intake of patients	Input initials of student who is seeing the patient on schedule	Initials system reduced confusion	Adopt
Problem: Submaximal student participation at beginning of clinic due to sequential patient visits				
11/3/16	Start clinic with overlapping appointments	Schedule two patients at 8:20 AM and 8:40 AM	Overlapping appointments put undue burden on attending physician	Need to further adjust timing of schedule





From 2015 to 2016, influenza vaccination uptake increased by 17.4%. A total of 98 vaccinations were given through the student vaccination clinic, which constitutes the 5.38% increase.

EDUCATIONAL OUTCOMES

UCSF MD Competencies	Learning Experiences
Patient Care	Provided vaccination for illness prevention; obtained focused patient information to screen for vaccination contraindications; performed injection with attention to patient comfort; documented patient encounter in electronic health record
Medical Knowledge	Learned the immunology, epidemiology, and rationale of vaccination; reviewed age-appropriate preventive care including cancer screenings, vaccinations, and blood pressure management
Practice-based Learning & Improvement	Accessed and applied national vaccination guidelines; selected proper needle gauge, injection location, and dosage based on patient age and vaccine type; addressed other health maintenance issues during vaccine clinic visit
Interpersonal & Communication Skills	Established rapport and communicated effectively with patients and families of diverse cultures and backgrounds; elicited and addressed concerns over vaccination
Professionalism	Respected patient privacy by maintaining confidentiality of patient information; navigated the balance of autonomy and need for supervision; acknowledged errors and limits of expertise
Interprofessional Collaboration	Conferred with nurses, medical assistants, and clerical staff about room availability, patient flow, stock supplies, and equipment; contacted interpreters for language translation
Systems-Based Practice	Implemented the student-run clinic as a quality improvement project to increase vaccination uptake; tested changes using PDSA cycles

CONCLUSIONS

- The student-run vaccination clinic increased influenza vaccination uptake by 5.38% from 2015 to 2016
- The student-run vaccination clinic provided students an early educational opportunity to:
  - Enhance all 7 MD competencies
  - Make meaningful quality improvements to clinic workflow
  - Increase uptake of flu vaccination and thus improve patient care

FUTURE DIRECTIONS

- Expand vaccination clinic to include HPV and other routine childhood vaccines
- Implement objective measures to evaluate vaccine clinic's alignment with MD competencies and impact on student learning

Sustainability

- Present benefits of vaccination clinic to UCSF School of Medicine administration to garner support for its continued operation
- Compile handbook of vaccination clinic practices to aid students in future implementation of the clinic
- Petition UCSF administration to allow use of standing order for influenza vaccines to increase clinic efficiency

Dr. Tenessa MacKenzie and MS1s
2017 Society of Teachers of Family Medicine

Student Quotes

Quality improvement is always a goal when it comes to patient care. In clerkship and residency, I will likely see how I can use my power and experience to change parts of the system

I learned a lot in this project and will definitely talk about my CMC project in my residency application.

This project was a really good way of reminding me there's more than just the one patient in front of us. When you're treating one patient, you're really treating the system

Why do Academic Health Centers want Health Systems Science Education?

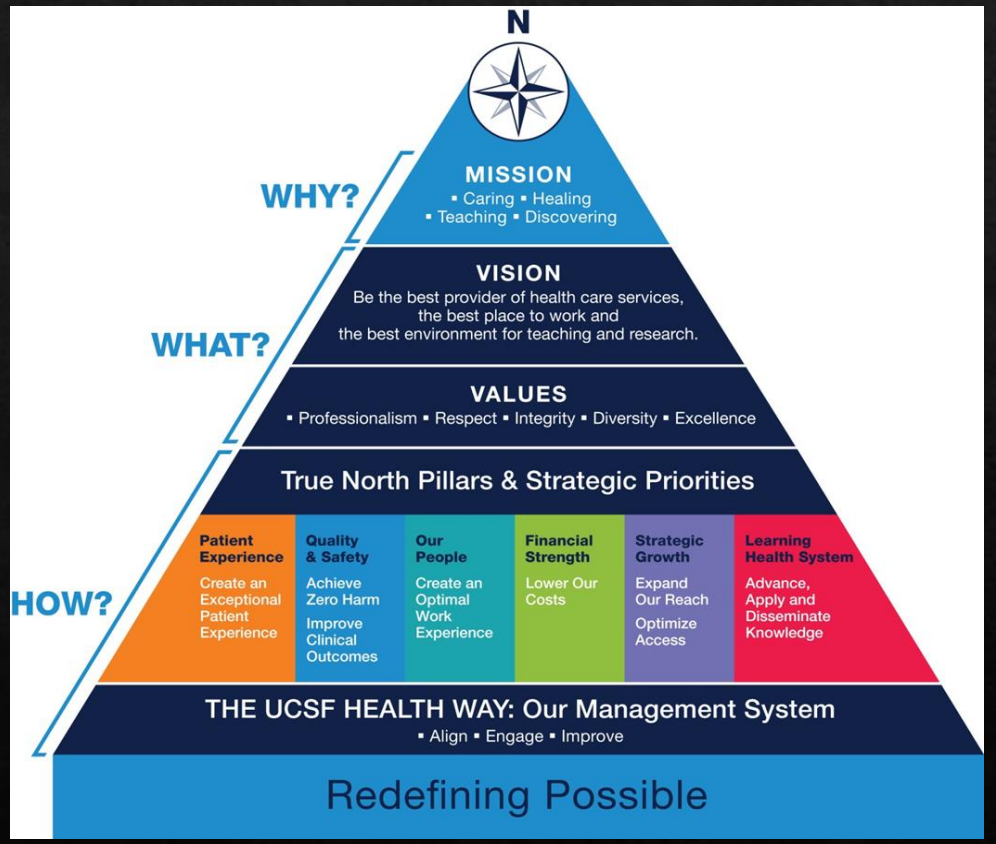
Adrienne Green MD
Chief Medical Officer
UCSF Health

Why Health System Science?
The Chief Medical Officer Perspective

- From my own story… Formal experiential training far more effective than learning by doing on the job (i.e. I wish I'd had this kind of training)
- Students enter medical school eager to contribute to positive change, and for exposure to improvement strategies and policy implications
- Early introduction and engagement in local health care value (quality/cost) work is key
- Systems based practice is a core competency for students, residents, fellows, and practicing physicians, so there is a need to build these skills for the long term, regardless of site and type of practice

Alignment is Key

- Alignment of student quality improvement projects with UCSF Health True North priorities and Lean strategies is key
- Health system and educational leaders collaborate and iterate each year
- Training for physician coaches and students:
  1. Health system priorities (to guide project selection and design)
  2. Lean improvement methodology (same as health system)
- Students integrate into existing improvement teams and ongoing work
- Students seen as unique contributors to teams & expand the improvement workforce



UCSF School of Medicine / Clinical Microsystems Clerkship (CMC)

Systems Improvement Template

Title: **Site: UCSF / SFVAMC / ZSFG** **Coach:** **Date:**

Student Team:

1. Background: ***What problem are you talking about and why?***

1. Problem

2. Current Conditions: ***Where do things stand now?***

2. Current State

Problem Statement:

3. Target Conditions (Goals): ***What specific outcome is desired?***

3. Target

4. Gap Analysis: ***Why does the problem exist?***

4. Gap Analysis

5. Experiments: ***What countermeasures do you propose and why?***

5. Experiments

6. Action Plan: ***How will you implement?***

6. Action Plan

7. Study, Reflect, Plan Next Steps: ***How will you assure ongoing PDCA?***

7. Reflection

Learning Health System:

Three Pillars of Alignment

Medical Students

Residents and Fellows

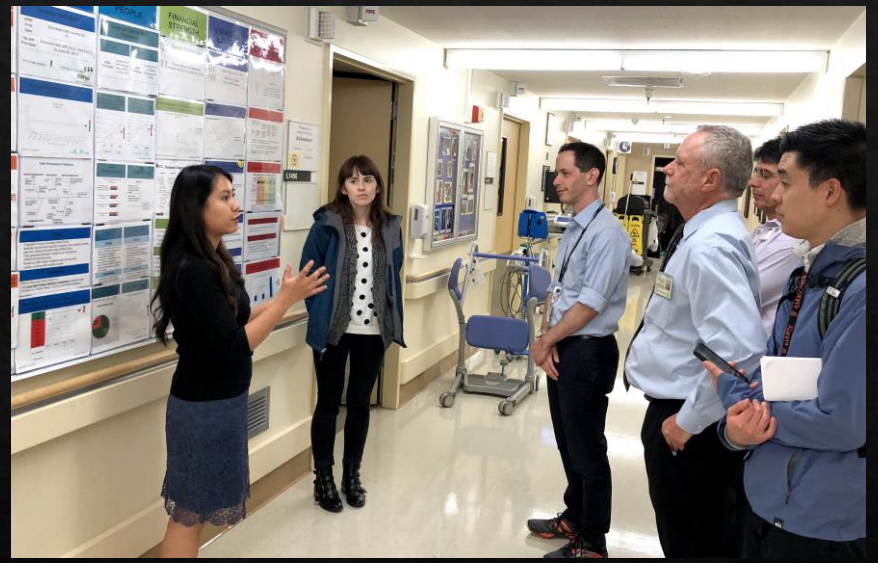
Faculty and Clinicians

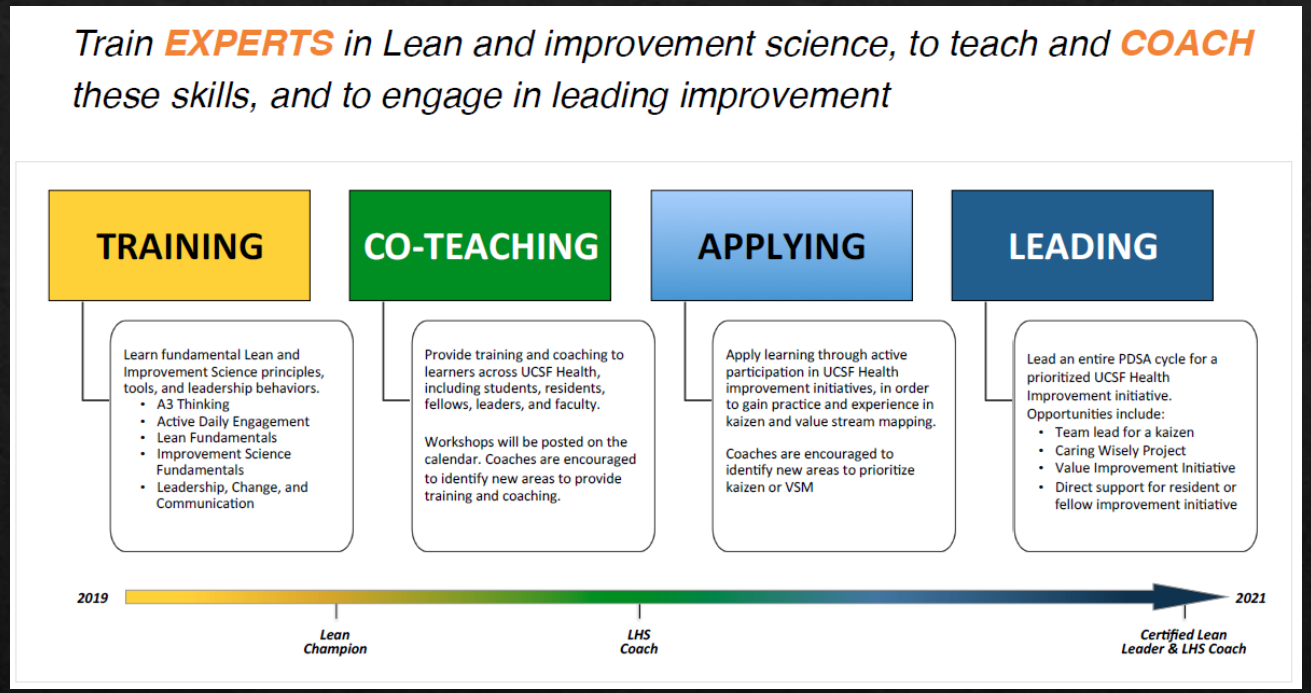
Students: Improving Care Delivery

Project	True North Pillar	Intervention	Outcome	Students Lessons Learned
↑ Narcan with opioids in Primary Care	Quality & Safety	Patient education, provider education	↑ Narcan prescription from 34% to 39%	Social stigmas are challenging and have an impact on interventions
↓ Opioid prescription after gynecologic oncology surgeries	Quality & Safety	Electronic medical record, provider education, patient education	↓ Opioid prescription by 30%, pain control same as baseline	Patients don't always read discharge instructions
↑ Patient satisfaction in behavioral health clinics	Patient Experience	Contact information for patients for non-emergent problems	↑ Press Ganey patient satisfaction score and ranking	Implementing change in a multidisciplinary clinic structure is challenging
↓ Falls with injury on medicine unit	Safety/Zero Harm	Standard workflow, falls huddle, patient education	↓ Falls with injury rate	Many patients don't recall the patient education

Residents and Fellows: Improving Care Delivery

- Our medical students become our residents and fellows
- UCSF Health Residents and Fellows REFLECT program
- Launched in 2007, now > 40 residency/fellowship programs participating to do improvement aligned with health system true north
- Residents/fellows receive lean training, propose projects, complete A3s, present to program and health system leadership at health system true north leader boards and leader rounds





Faculty and Clinicians: Learning Health System Coach Program

Student Presentation Video

(5 minutes)

https://www.youtube.com/watch?v=QiN2dvLENoE

Less Is More: Postoperative Reduction of Dexamethasone in GBM Patients

Alvin Ho, MS2 and Amin Sarraf, MS2/OMFS
Shannon Fogh, MD, Radiation Oncology, UCSF Health
Sujatha Sankaran, MD, Hospital Medicine, UCSF Health
Madeline Chicas, MHA, Neurosurgery, UCSF Health

UCSF School of Medicine
Clinical Microsystems Clerkship
Health Systems Improvement Symposium
November 18, 2019

Background

- Corticosteroid therapy (especially dexamethasone) has been a standard treatment since the 1960s to reduce peritumoral edema following craniotomy.
- However, there is no human data to support this practice
- There are currently no evidence-based guidelines for administering steroids in craniotomies post-operatively

Adverse Effects of Steroids

- Occur with prolonged use of high doses
- Cushing's disease

Psychiatric
- Sleep disturbance/activation
- Mood disturbance
- Psychosis

Skin/soft tissue
- Cushingoid appearance
- Abdominal striae
- Acne
- Hirsutism
- Oedema

Neurologic
- Neuropathy
- Pseudomotor cerebri

Cardiovascular
- Hypertension

MSK
- Osteoporosis
- Asceptic necrosis of bone
- Myopathy

Endocrine
- Diabetes mellitus
- Adrenal cortex suppression

Immunologic
- Lymphocytopenia
- Immunosuppression
- False-negative skin test

Opthalmic
- Cataract
- Narrow-angle glaucoma

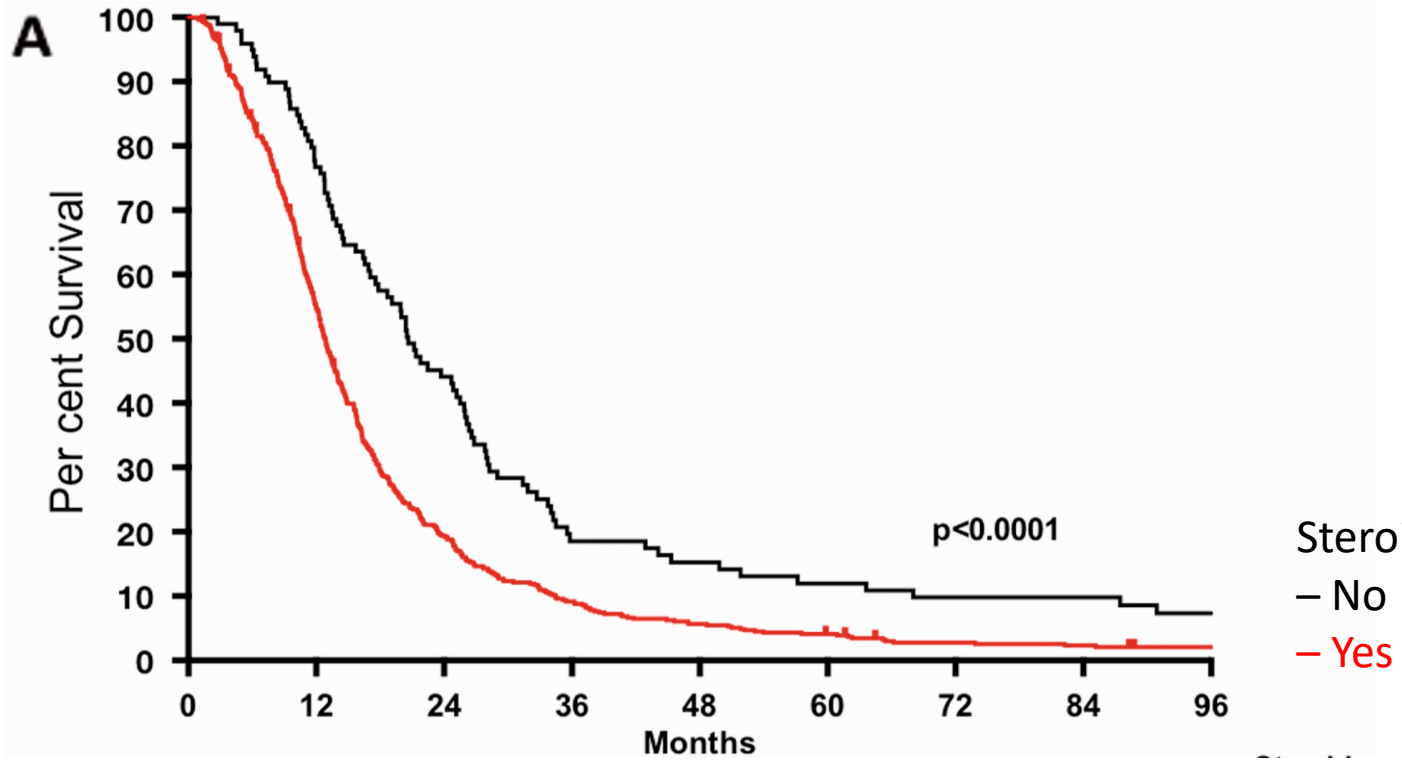
Developmental
- Growth retardation

Background

- At UCSF, there is a longstanding practice of treating postoperative brain tumor patients with a 17-day dexamethasone taper starting with 4 mg four times daily.
- A recent trial found that a 10-day dexamethasone taper starting at 4 mg twice daily led to a significant reduction in the incidence of new or worsened hypertension
- At UCSF, starting with a higher initial dose leads to a 4x higher cumulative dose over the course of their taper.

(Breshears et al., World Neurosurgery 2019)

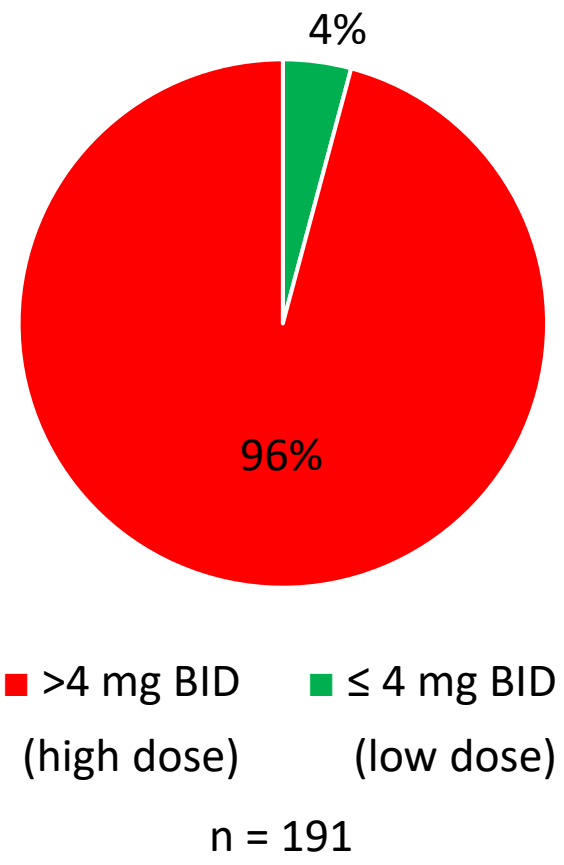
Background



(Pitter et al., Brain 2016)

Current State and Target

Dexamethasone Dose on POD1 in GBM Patients (July 2018 – Dec 2018)



Target:

Increase the proportion of GBM patients receiving a lower starting dose of dexamethasone from 4% to 20% by August 2019.

Gap Analysis

Interviews with one nurse practitioner, one neurosurgery resident, three neurosurgery attendings, and four patients revealed the following:

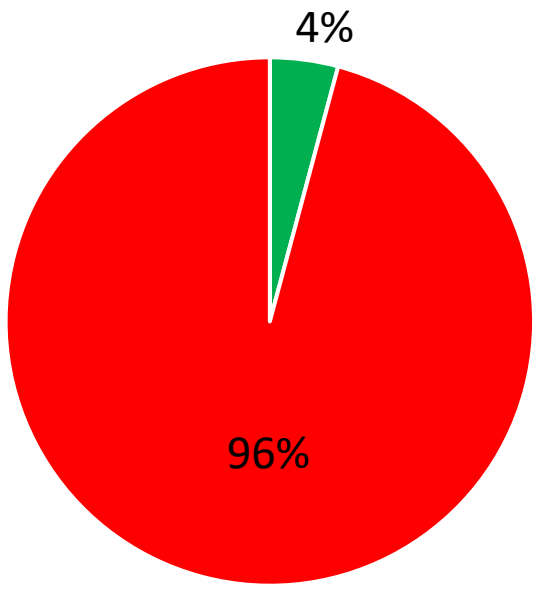
- Providers were not aware that they were over-prescribing steroids
- Concern that reducing the dosage of steroids would compromise patient care
- All four patients reported multiple negative side effects such as mood changes, headaches, nausea, and trouble sleeping
  - One patient was in steroid-induced psychosis

Interventions

- A new postoperative order set was launched in Jan 2019
- This created an opportunity for physicians to choose a lower postoperative dexamethasone dose rather than default to the standard higher dose
- Education campaign to raise awareness and encourage usage of the new order set
  - Created flyers to promote new order set
  - Spoke individually with neurosurgery residents and attendings about the potential impact of steroids on their patients

Results

Dexamethasone Dose on POD1 in GBM Patients (July 2018 – Dec 2018)



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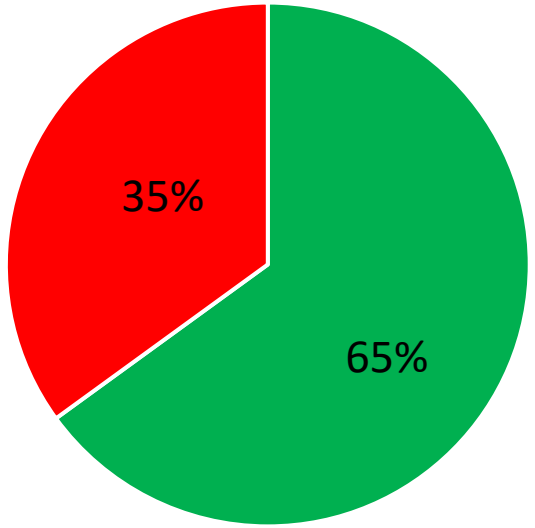
Dexamethasone Dose on POD1 in GBM Patients (July 2019)



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Takeaway Points

- Lessons learned:
  - Simple interventions such as promoting the use of a surgical order set can lead to impactful changes
  - One on one interviews discussing data with residents and attendings may result in more patient-centered care and better outcomes

Conclusion: Take Home Points

Because of the gaps in our health care systems, today's medical educators need to add health systems science early in undergraduate medical education.

There are models to integrate health systems science into classroom and experiential learning in the first two years of medical school for early students.

Academic health system leaders perceive an alignment and value in having early medical students engaged in health systems improvement

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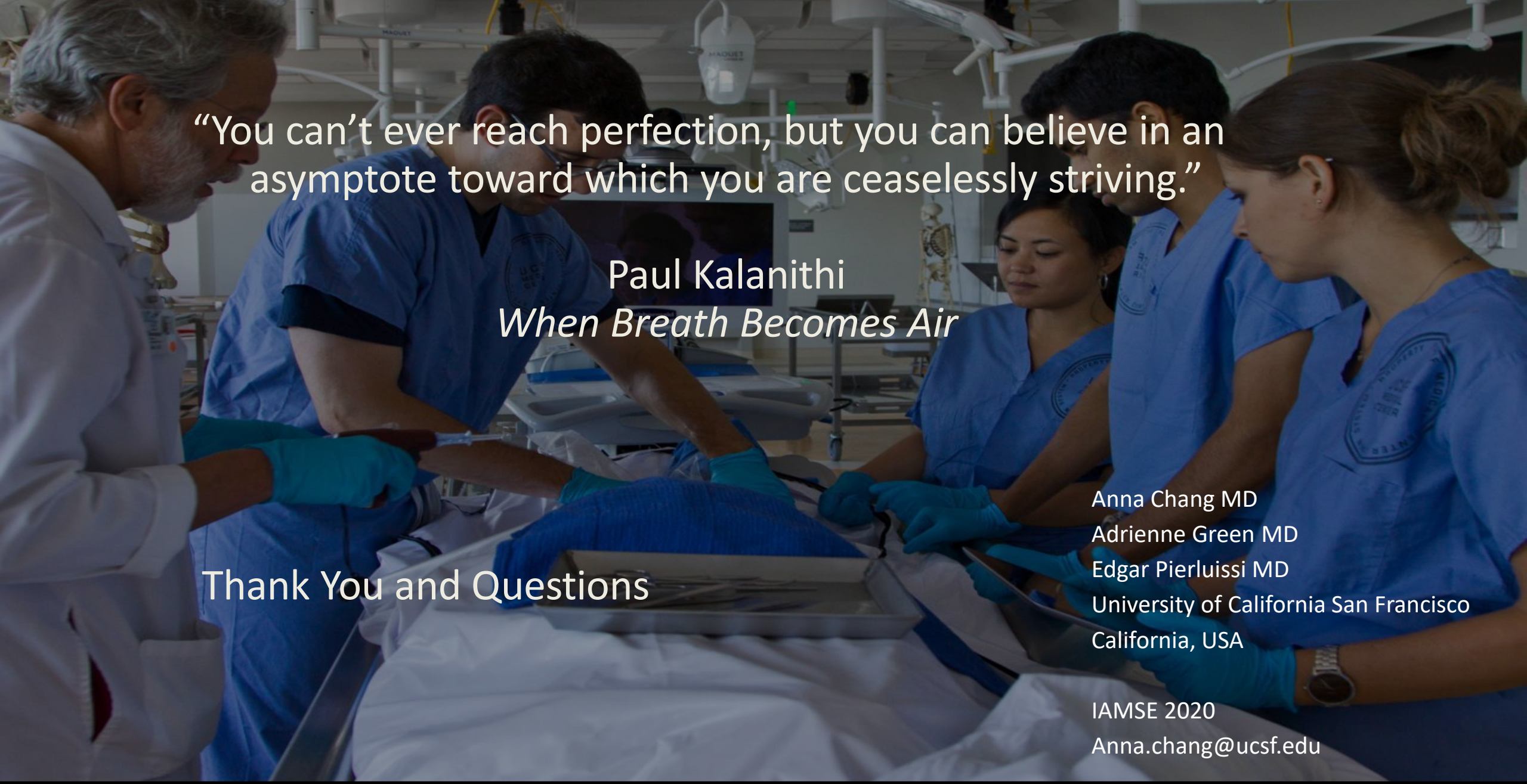

"You can't ever reach perfection, but you can believe in an asymptote toward which you are ceaselessly striving."

Paul Kalanithi
When Breath Becomes Air

Thank You and Questions

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