



Stanford
MEDICINE



ANESTHESIA
INFORMATICS
AND MEDIA LAB

MASSIVE OPEN ONLINE COURSES

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AIM LAB FUNDING

Stanford University Department of Anesthesia
Agency for Healthcare Research Quality
IARS, National Institutes of Health

Cedars-Sinai Medical Center
St. Elizabeth's Medical Center
University of Cincinnati
University of Iowa
SUNY Downstate Medical Center
John H. Stroger, Jr. Hospital

University of Kansas-Wichita
Mayo Clinic
Tulane University
University of Illinois
Loyola Medical Center
The Tides Foundation

Columbia University
New York University
Tufts University
University of Rochester
University of Tennessee
San Antonio Foundation



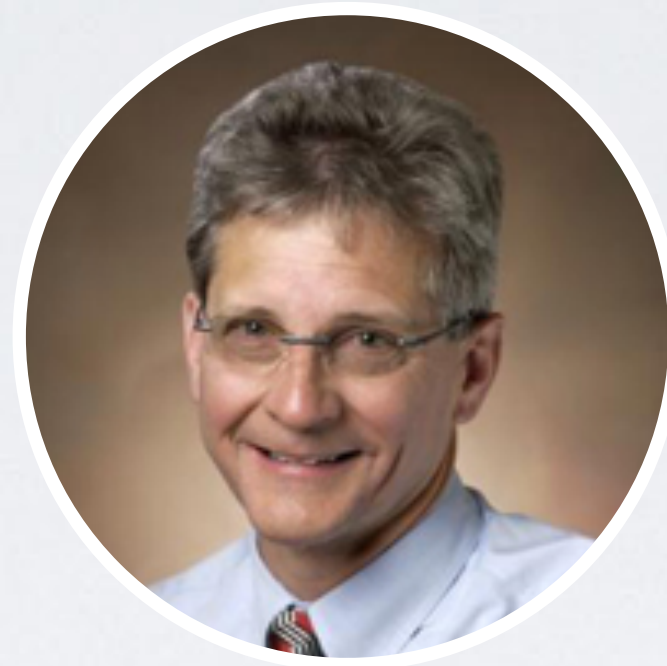
SOME OF THE PEOPLE WHO HELPED



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Stanford AIM Lab



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- *Yale University (Viji Kurup, MD)*
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- *University of Rochester, New York (Carol Diachun, MD)*
- *University of Massachusetts (Elifce Cosar, MD and Ellie Duduch, MD)*
- *Tulane University (Michael Yarborough, MD)*
- *UC San Diego (Beverly Newhouse, MD)*
- *University of Alabama (Susan Black, MD and Lee Ann Riesenber, MD)*

CURRENT AIM LAB MOOC COURSES



Medical
Education in the
New Millennium



Engage +
Empower
Me



STARTprep:
Anesthesia
Basic Sciences



START
Anesthesia
Residency

DEFINITION

MASSIVE OPEN ONLINE COURSE

What is massive?

- 100?
- 1,000?
- 10,000?
- 100,000?

Open registration?

Local cohorts?

Self-paced?

Start/end dates?

College credits?

Badges?

Role of the instructor?

Learning community?

Scripted assessments and feedback?

M O O C

MASSIVE OPEN ONLINE COURSE

Open content?

Free of charge?

Affordable?

Real-time interaction?



FOCUS ON SCALABILITY



FOCUS ON COMMUNITY AND CONNECTIONS



Help

Medical Education in the New Millennium

YOU ARE REGISTERED FOR THIS COURSE

VIEW COURSEWARE



VIEW ABOUT PAGE IN STUDIO

overview

ABOUT THIS COURSE

This **interdisciplinary course** features talks from thought leaders and innovators from medical education, instructional design, cognitive science, online learning, and emerging technology. Over the course of eleven weeks, we'll consider how to build educational experiences that address the unique learning preferences of today's Millennial medical students and residents. As the volume of new medical knowledge outpaces our ability to organize and retain it, how might educators disrupt outdated practices through thoughtful use of technology and learning design? How might MOOCs, social media, simulation and virtual reality change the face of medical education? How might we make learning continuous, engaging, and



i Course Number **ANES204**

📅 Classes Start **Oct 01, 2014**

OUR RESEARCH COMMUNITY

Stanford University pursues the science of learning. Online learners are important participants in that pursuit. The information we gather from your



Courseware

Course Info

Discussion

Progress

Instructor

Staff view

Help

▼ Introduction to the Course

Getting Started with Medical Education in the New Millennium

A Patient's Perspective: Britt Johnson

Speakers: Larry Chu, MD, MS, Kyle Harrison, MD, Nikita Joshi, MD

Discussion Question

▶ Cognition and Learning

▶ Bringing the Patient Voice to Medical Education

▶ Reimagining Undergraduate Medical Education

▶ Simulation, Part-task Trainers, and 3D-printing

▶ Social Media: Harnessing Distributed Expertise

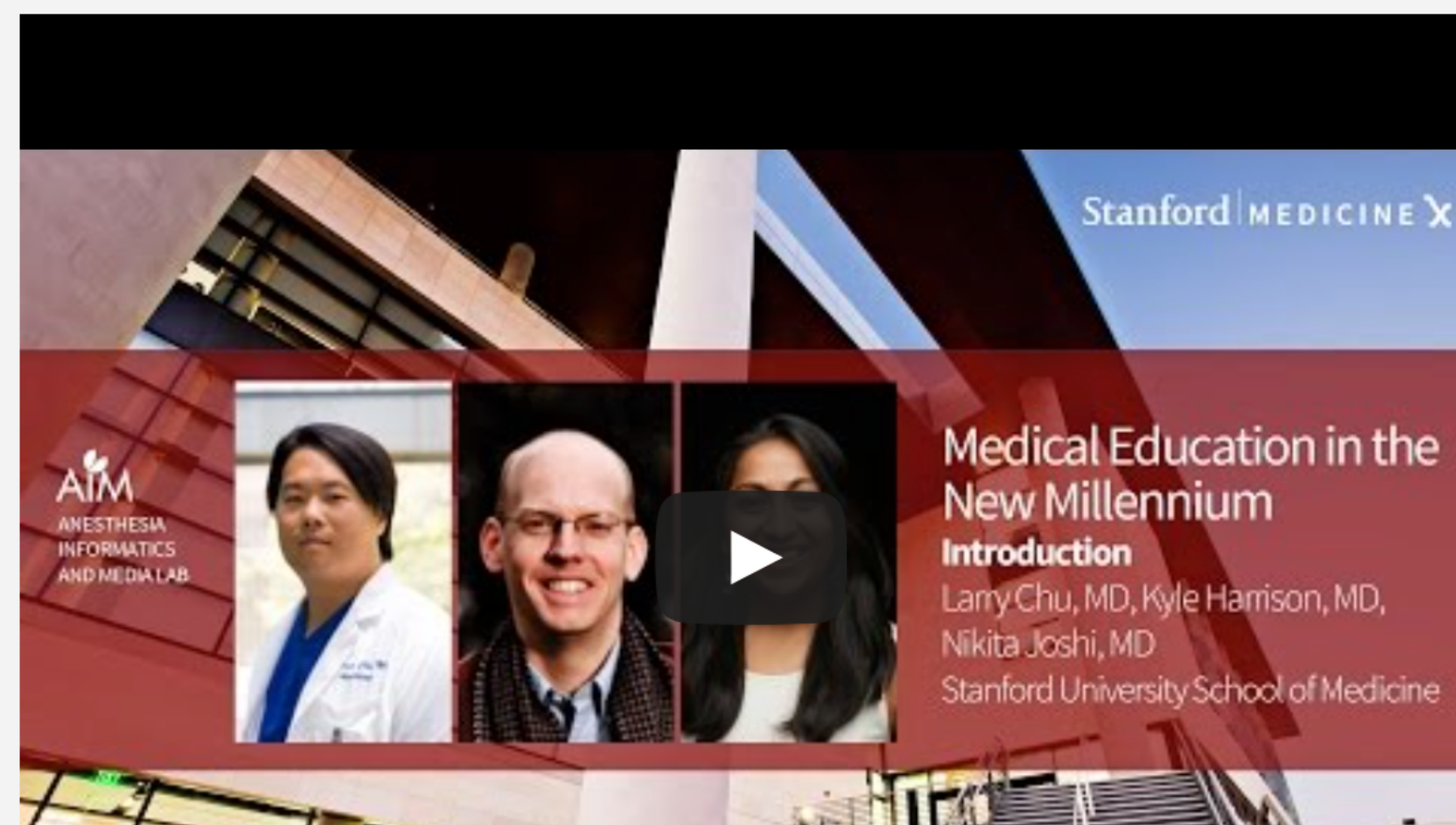


[VIEW UNIT IN STUDIO](#)



[STAFF DEBUG INFO](#)

VIDEO



victim.

But in recent years the patient movement have redefined what it means to

be a patient.

We are no longer the noun or the passive definition of the patient.

We're the adjective quote, quietly and steadily persevering.

Well, maybe not so quietly, but we are the provocation.

We have expressed our annoyance with the healthcare system.

- ▶ Bringing the Patient Voice to Medical Education
- ▶ Reimagining Undergraduate Medical Education
- ▶ Simulation, Part-task Trainers, and 3D-printing
- ▶ Social Media: Harnessing Distributed Expertise
- ▶ Massively Learning Together, Scaling Distributed Learning- MOOCs
- ▶ The Power of Peer-to-peer Learning
- ▶ Patient Safety and Cognitive Bias
- ▶ Bringing Virtual Learning into the Real World
- ▶ Challenging Authority in Different Medical Cultures

Stanford MEDICINE X

AIM ANESTHESIA INFORMATICS AND MEDIA LAB

Medical Education in the New Millennium
Introduction
 Larry Chu, MD, Kyle Harrison, MD, Nikita Joshi, MD
 Stanford University School of Medicine

This video was recorded in front of a live studio audience at Stanford University.

>> So hi there, I'm Larry Chu, associate professor of anesthesia at Stanford, and executive director of Medicine X.

On behalf of my course co-directors, Kyle Harrison and

Nikita Joshi, welcome to medical education in the new millennium, a new course from

STAFF DEBUG INFO



KEY INSIGHT

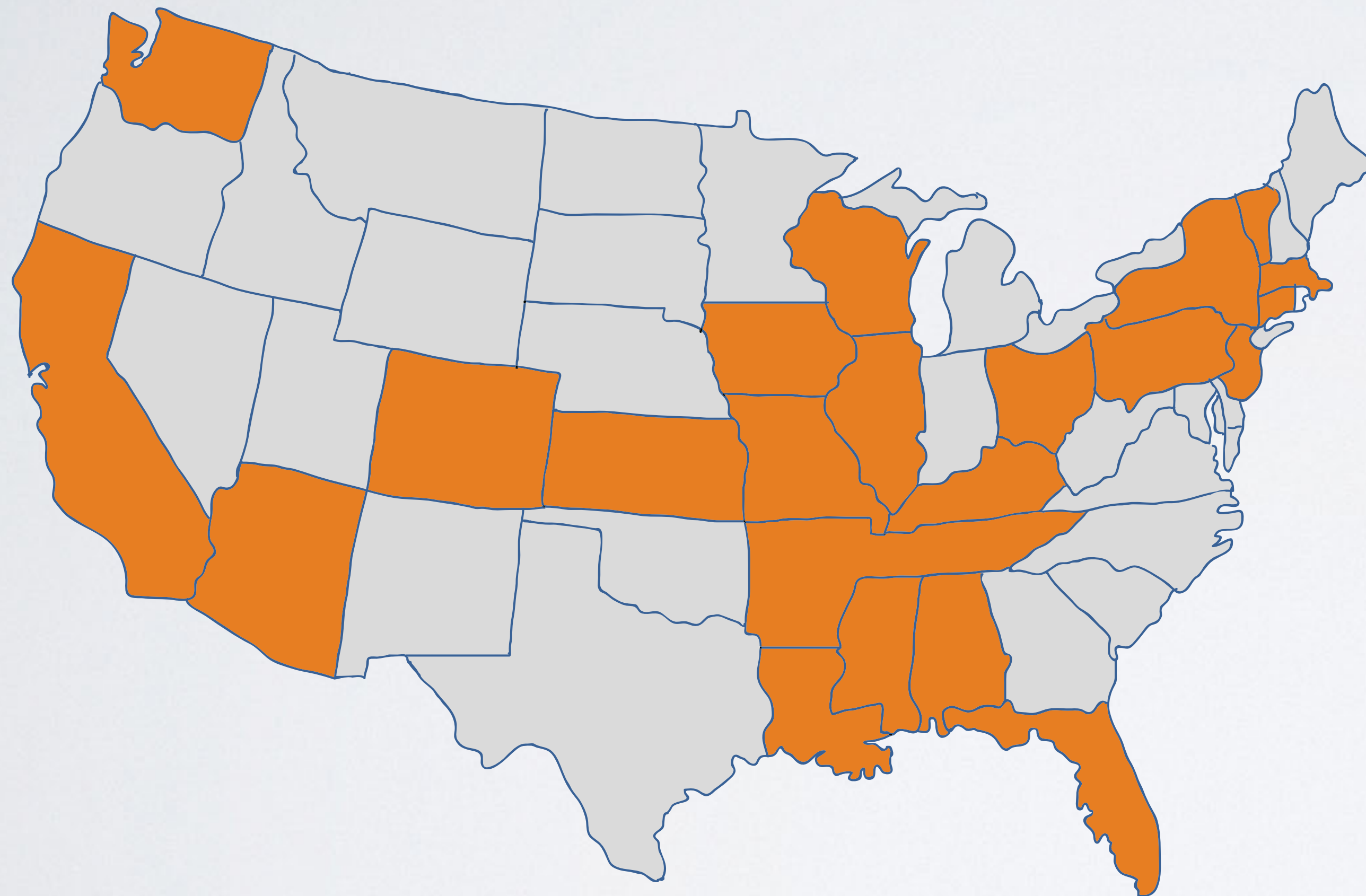
"If the practice of participatory medicine requires a team effort, could we think of medical education in the same way?"

-Dr. Larry Chu

STAFF DEBUG INFO

Use the arrow below to move on to the next screen.

STARTPREP MOOC



15 Months

1200 Anesthesia Learners

36 Programs = 25% US

1 Australia

1 South Africa

2014: 990/3517 = 28% US



BACKGROUND

- **Majority of current residents are millennial learners**, incorporating new technologies and fast, mobile delivery of information.
- **Accustomed to mobile, online learning from grade school through medical school**, expecting similarly sophisticated teaching modalities in residency.
- **STARTprep was created to meet this need for a time-shifted, place-shifted method of learning that strategically promotes an incremental model of studying** (vs. cramming) to prepare residents for high stakes educational milestones.



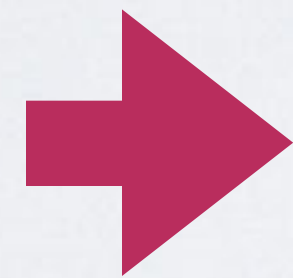
UNIQUE AFFORDANCES

340+ online learning modules,
organized around anesthesia basic sciences.
STARTprep is not marketed as a board
review course.

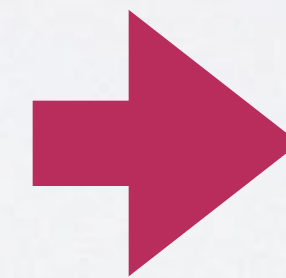
UNIQUE AFFORDANCES



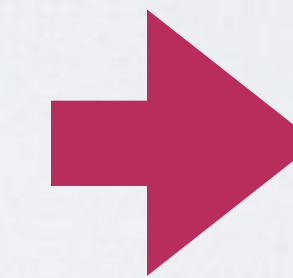
Daily
Trigger
Email



Short
Online
Reading



Knowledge
Assessment
Questions



Introduction to Lesson

Monday, September 8, 2014

Ventilators: Classification: Flow Generation vs. Pressure Generation



James M. Hunter, Jr., MD
Assistant Professor of Anesthesiology and Surgery
University of Alabama at Birmingham

Support

Learning Objectives:

After completing this lesson the learner will be able to:

1. Describe the flow patterns in flow-targeted and pressure-targeted mechanical breaths.
2. Contrast how changes in lung compliance and chest wall compliance affect airway pressure and tidal volume in a flow-targeted breath vs. a pressure-targeted breath.
3. Contrast how changes in airway resistance affect airway pressure and tidal volume in a flow-targeted breath vs. a pressure-targeted breath.
4. Explain how pressure support differs from pressure control.

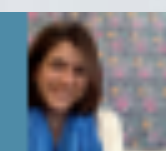
What would you do?



A 52-year-old woman is slow to awaken after general anesthesia for total abdominal hysterectomy. She is transported to the PACU and mechanical ventilation with volume-control is initiated. 30 minutes later, the nurse calls because the patient is "fighting the ventilator" and the peak inspiratory pressure alarm is sounding. Evaluation reveals that the patient is attempting to exhale toward the end of mechanical inspiration. *How might the choice of mechanical breath type influence the patient's ability to tolerate mechanical ventilation? How would changing to pressure-support change the situation?* You'll uncover our answer after completing today's module!

Lesson with Writable Questions -->

Lesson With Reflection Questions -->



Mon 09/08/14 - Ventilators: Classifications: Flow Generation vs. Pressure Generation ?

Preview

Edit

Reports

Grade essays

Positive Pressure Breaths

The flow pattern of a mechanical breath is determined by parameters controlled by the ventilator. These include: airway pressure, tidal volume, flow, and duration.

This chapter describes the common types of positive pressure breaths:

- volume-control
- pressure-control, and
- pressure support.

Each of these breath types is useful in the operating room. For example, pressure support can be used with an LMA during eye surgery to reduce movement of the eye due to the patient's inspiratory efforts.



Support

Check your understanding!

- List the parameters that can be controlled by the ventilator in delivery of a positive pressure breath.

[Move on to the next section!](#)

**Question 1**

Marked out of 1.00

[Flag question](#)

Write a personal note

[save question note](#)

Send feedback to teacher

[send feedback](#)[Edit question](#)**Question # Q1L1D66W13**

How is most blood carbon dioxide transported?

Select one:

- A. As carbaminohemoglobin
- B. As bicarbonate ion (HCO_3^-)
- C. As dissolved CO_2
- D. As carbonic acid (H_2CO_3)

Support

Question 2

Marked out of 1.00

[Flag question](#)

Write a personal note

[save question note](#)

Send feedback to teacher

[send feedback](#)[Edit question](#)**Question # Q2L1D66W13**Which of the following is **NOT** a determinant of mixed venous oxygen content?

Select one:

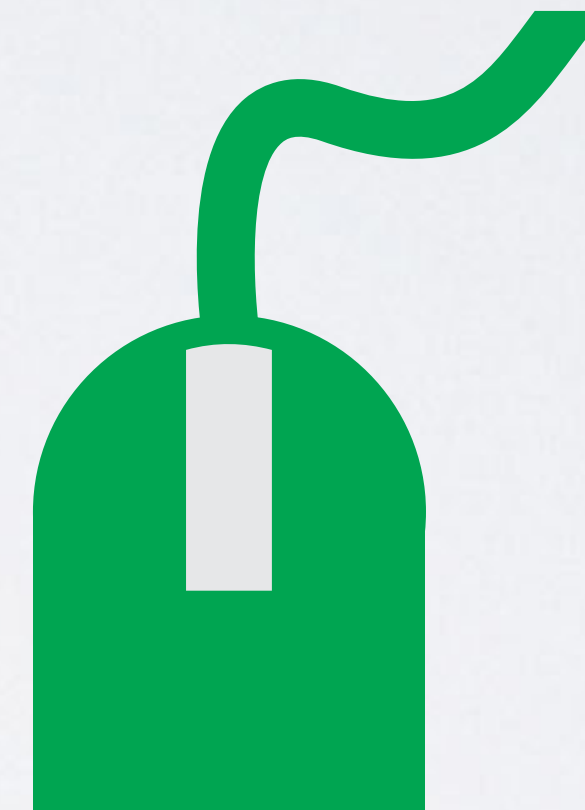
- A. Hemoglobin
- B. Arterial oxygen content
- C. Oxygen consumption
- D. Partial pressure carbon dioxide
- E. Cardiac output



WHO'S USING STARTPREP?



99% used learning technologies in college



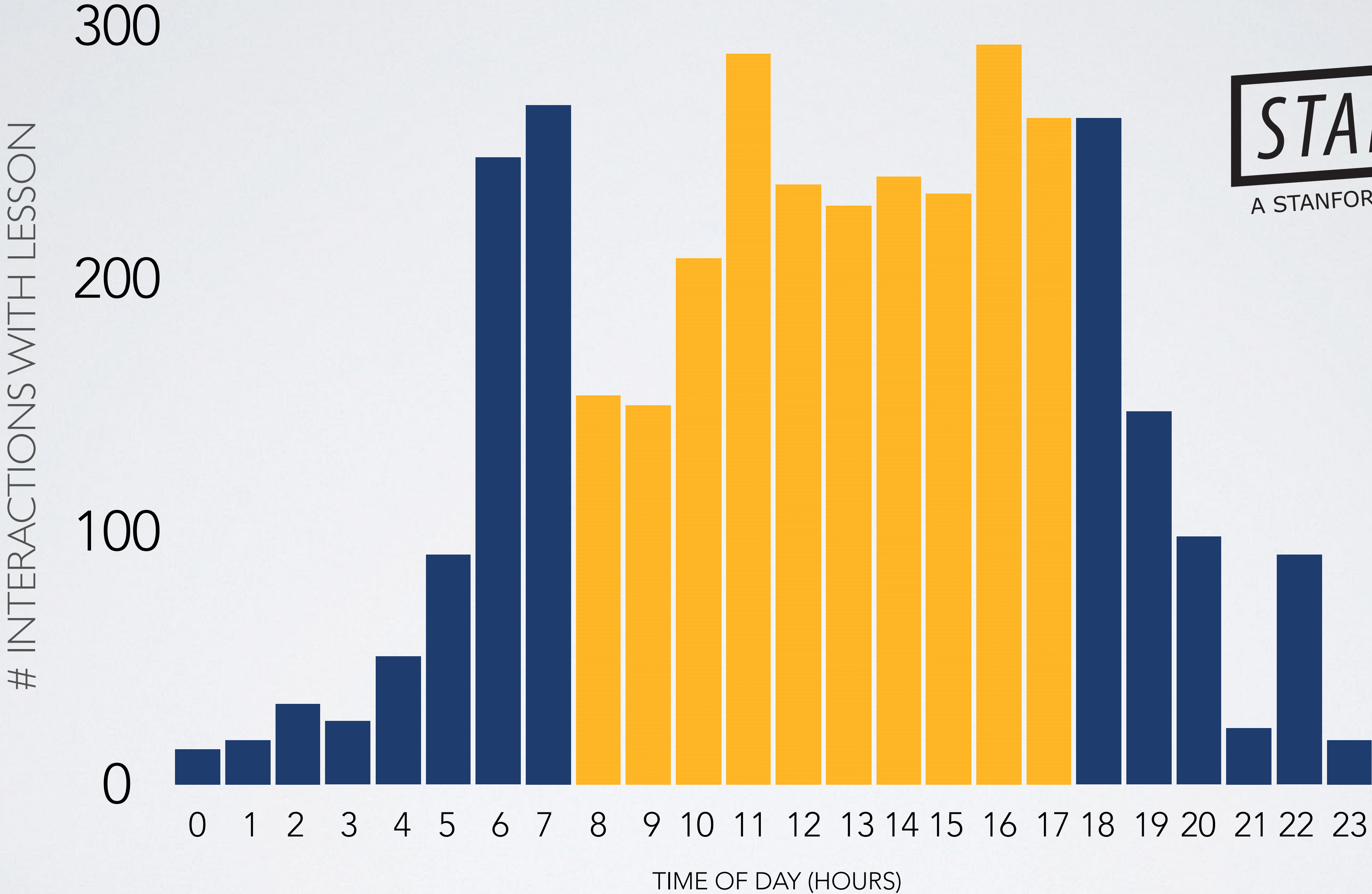
59% completed an online course before



STARTPREP MORE ENGAGING

- **81% of residents** who have been using the course for at least 3 months **say that STARTprep is more engaging than traditional study methods**
- **86% of residents** say STARTprep is more engaging than **traditional lectures**

LEVEL OF ENGAGEMENT OVER 24 HOURS



STARTPREP
A STANFORD **AIM LAB** PROJECT



Time Shifting

98% of residents say they use STARTprep to learn and study at convenient times not possible with in person courses



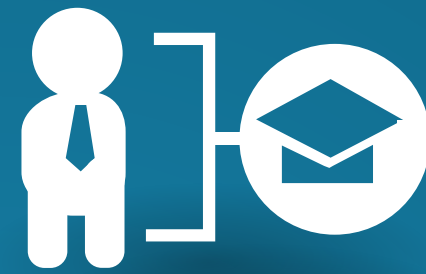
Podcasts

Podcast episodes have been downloaded 2,604 times across eight countries



Participation

1/3 of residents open daily course emails and 29% click through to the course



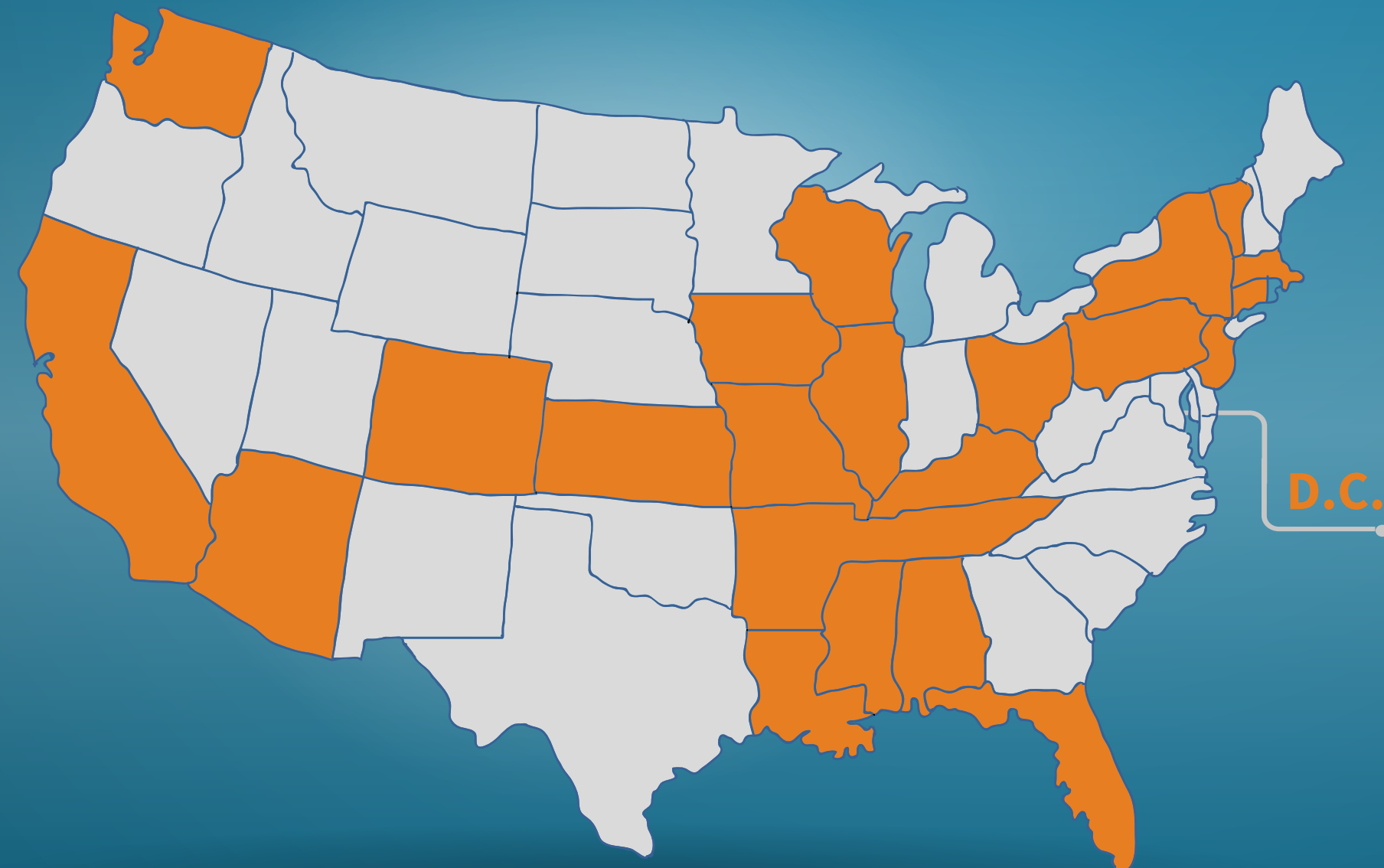
Demographics

42% female
 62% ages 25-30
 45% on facebook
 22% 1° caregiver



Mobile Learners

58% of residents primarily access STARTprep from a mobile device such as an iPhone



990 Residents

Residents from 38 residency programs across US, 1 in Australia and 1 in South Africa

95% of residents rate STARTprep chapters as being good, very good or excellent.

95%



86% of residents say STARTprep is more engaging than traditional lectures.

86%



88% of residents say that STARTprep makes them feel more prepared for high stakes educational milestones.

88%





CLINICAL APPLICABILITY

- **92% of respondents** say that STARTprep helps them **make better clinical decisions**
- **94% say** STARTprep helps them **feel more prepared for daily cases**



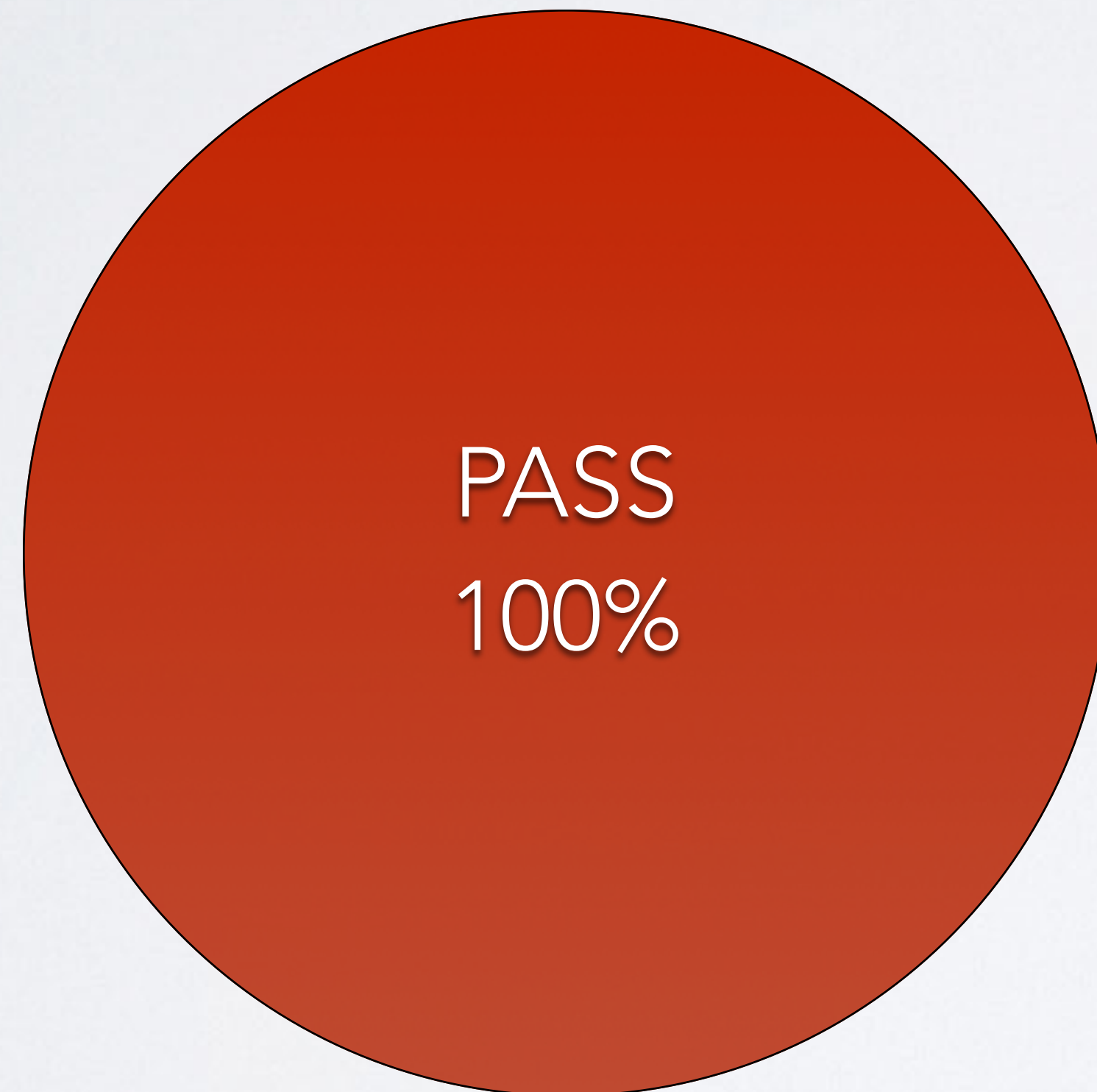
SUMMARY

Initial results show the program helps learners:

- **Feel more prepared for high stakes educational milestones**
- **Engages learners more** than traditional lectures and study methods
- Allows residents to **learn at times that are convenient** to their needs and lifestyles
- **Reveals strengths and gaps in residents' knowledge** of the anesthesia basic sciences



OUTCOMES (2013 COHORT)



2013 STARTprep
Programs
Reporting ABA
Part 1 Results

START_{plus} FLIPPING THE MOOC

2011 Anesthesia Residents START Program You are logged in as Larry Chu: Student (Return to my normal role)

Ether ▶ START11 Return to my normal role

People
Participants

Activities
Assignments
Forums
Quizzes
Resources

Search Forums
Advanced search ?

Administration
Grades
Profile

Course categories
Miscellaneous
Clinical Rotations
All courses ...

Topic outline



Latest News
(No news has been posted yet)

Upcoming Events
There are no upcoming events
[Go to calendar...](#)
[New Event...](#)

Recent Activity
Activity since Saturday, 21 May 2011, 09:00 AM
[Full report of recent activity...](#)
Nothing new since your last login

1 September: Introduction to START
Successful Transition to Anesthesia Residency Training - START - is a ten month online educational and virtual mentorship program designed to ease your transition from internship to anesthesia residency at Stanford. The program is comprised of ten concise online learning modules.
[#1.1: Complete the START Preparedness Survey](#)
[#1.2: Tell us about yourself](#)
[#1.3 Please watch this month's podcast](#)

2 October: Induction of General Anesthesia
Please do the activities in the order they are listed below. Thanks.
[#2.1: Podcast/Lecture Pre-Quiz](#)
[#2.2: Please View Podcast #2](#)
[#2.3: Please Watch This Month's Lecture](#)
[#2.4: Podcast/Lecture Post-Quiz](#)
[#2.5: Icebreaker Team Forum](#)
[#2.6: How well do you know your classmates?](#)
[#2.7: Please complete the October course evaluation](#)

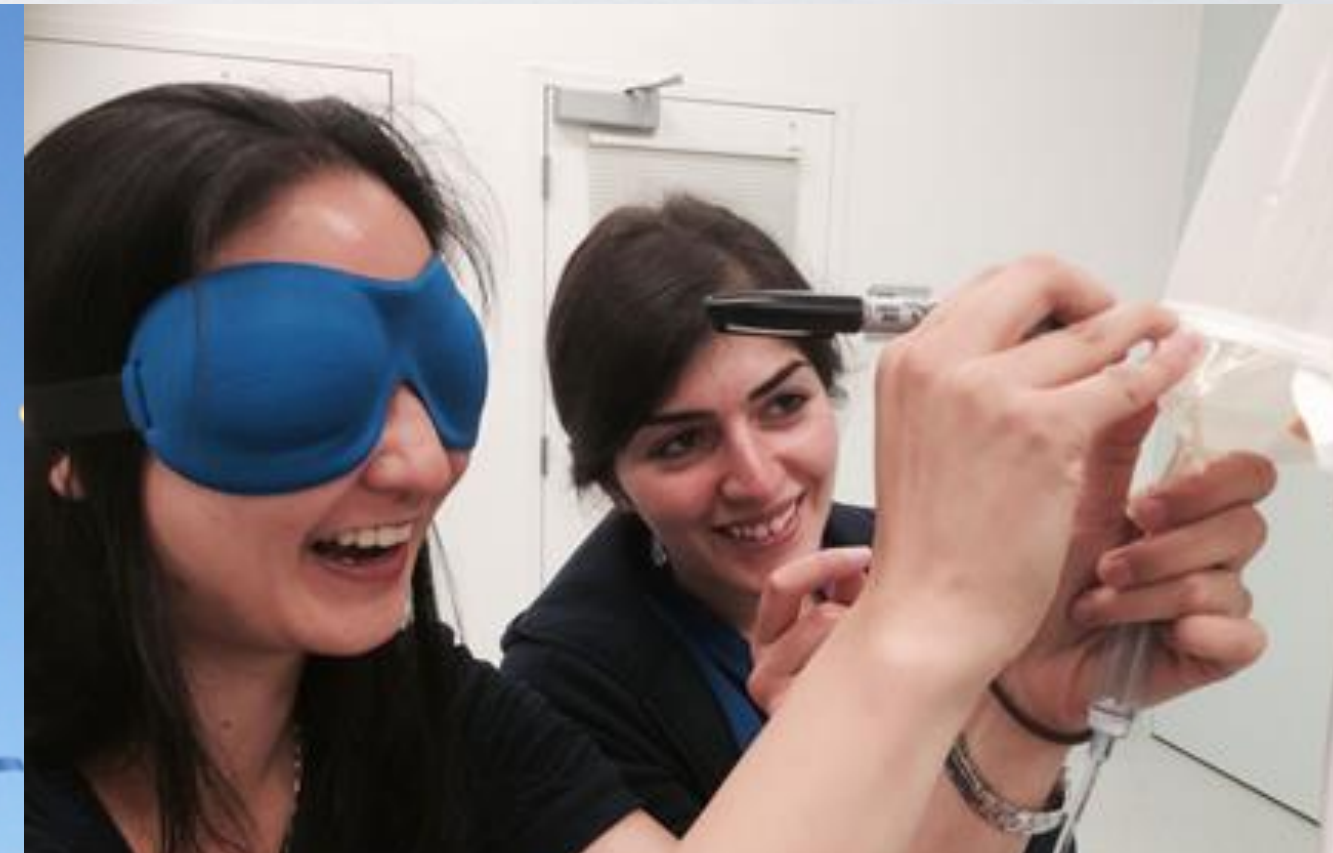
5 Years

1000+ Anesthesia Interns

Baylor, Cedars-Sinai Medical Center, Cook County, Cooper, Drexel, Geisinger, George Washington University, New York University, Medical College of Wisconsin, St. Elizabeth's, Stanford, Tufts University, Tulane, UC Davis, UC San Diego School of Medicine University of Alabama, University of Calgary School of Medicine, University of Cincinnati, University of Florida-Jacksonville, University of Kansas-Wichita, University of Massachusetts Medical School, University of Saskatchewan College of Medicine, University of Vermont, University of Washington, Yale University

2014: 257/1029 = 25%

START_{plus} FLIPPING THE MOOC



DELIVERY PLATFORMS

Moodle

OpenEdX, Coursera, NovaEd

PRODUCTION COSTS

Online Course with 10 hours of Video

\$43,344

PRODUCTION COSTS

STARTprep

Platform (2), Programming (1), Q&A (2),

Research (5+)

\$100,000+*

Stanford AIM Lab receives voluntary donations to help offset these costs*

EDITORIAL COSTS

STARTprep

300+ contributors across 13+ institutions

Questions (1), Content (4), Media/Design (3)

Stanford AIM Lab receives voluntary donations to help offset these costs*

SUITABLE AND BEST FOR WHICH
SETTING/GROUP?

Large learning cohorts
Disseminate knowledge widely
Culture/practice change

PROS

Scaleable

Time- and place-shift learning

Widens community of learners

Wide dissemination of learning resources

Accessibility and inclusion

CONS

Expensive

Legalize can be cumbersome

Knowledge assessment is limited

Difficult to design for engagement

High drop out rates

CURRENT STATE AND FUTURE

Better assessment methods

Flipping the MOOC

Online behaviors predict real world learning?

Personalize and targeted curriculum

START AND STARTPREP 2015 ENROLLMENT



STARTprep:
Anesthesia
Basic Sciences



START
Anesthesia
Residency

aimlabstanford@gmail.com

June 15, 2015

www.startprep.org

PLEASE JOIN US



LIVE

Medical Education
in the New Millennium

<http://stanford.io/1vdKm2U>



Stanford
MEDICINE

APPLICATIONS DUE DEC 1, 2014

**ANESTHESIA EDUCATION, LEARNING DESIGN
AND TECHNOLOGY FELLOWSHIP**



Reuben Eng
Education Fellow
Stanford AIM Lab
2013-2014



Janak Chandrasoma
Education Fellow
Stanford AIM Lab
2014-2015



Stanford | MEDICINE X

THE INTERSECTION OF MEDICINE AND EMERGING TECHNOLOGIES

SEPTEMBER 23, 2015

THE FUTURE OF MEDICAL
EDUCATION

