



University of California  
San Francisco



# Practice Makes Perfect

*Using technology, simulation, and standardized patients*


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*Education Director, UCSF Kanbar Center for Simulation and*

*Clinical skills*

A piece of brown, textured paper with a jagged hole. The hole reveals a white background where the word "Disclosures" is written in a black, serif font. To the left of the hole, a small, cylindrical piece of the same brown paper is curled up.

Disclosures

**None**

# A Question for You

Your experience...

- How did you learn the skills you use every day?
- And what about skills you only need on rare occasions?



# Practice makes perfect: Simulation and more

## Objectives

- Understand the challenges with skill practice in health professions education
- Define simulation and identify different simulation modalities
- Describe the use of simulation and related educational strategies in HPE
- List limitations and challenges associated with simulation

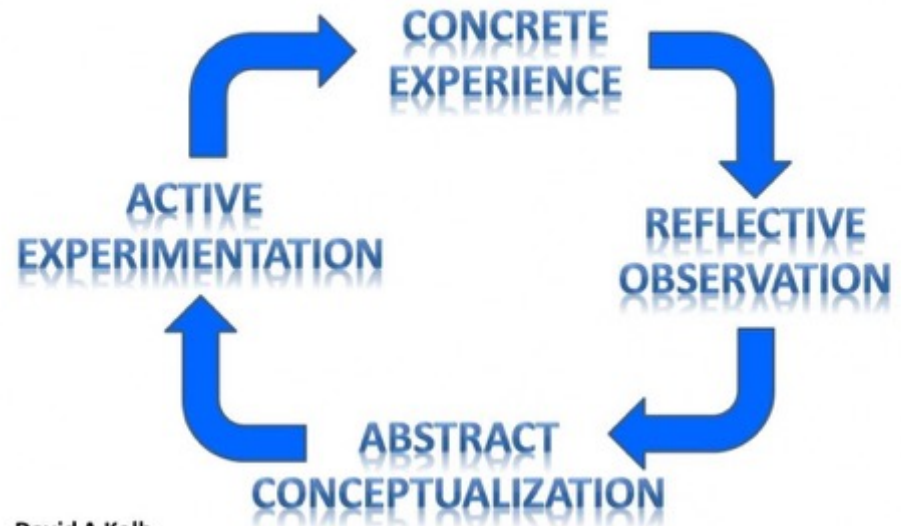


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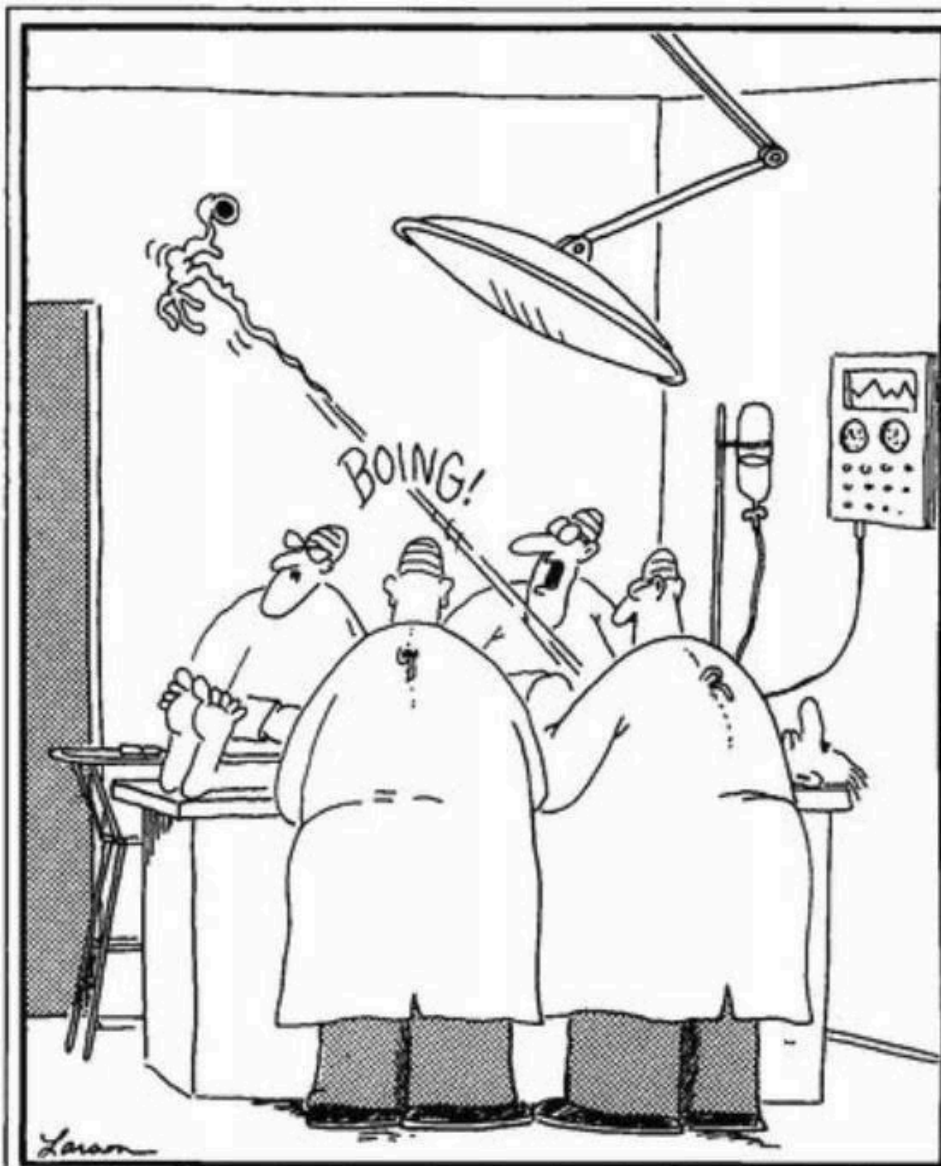
# Practicing Skills in Health Professions Education

- There is only so much you can read in a book
- Perfection comes from practice
- Experiential learning model

## Experiential Learning Model



David A Kolb



“Whoa! Watch where that thing lands — we’ll probably need it.”



“Correct. And in the case of a cardiac arrest, every second counts. Who can tell me why? Anyone? Clock’s ticking.”

# Deliberate practice: Path to Expertise

## THE FIVE PRINCIPLES OF DELIBERATE PRACTICE



**PUSH  
BEYOND**  
one's comfort  
zone



Work toward  
well-defined,  
**SPECIFIC  
GOALS**



**FOCUS**  
intently on  
practice  
activities



Receive and  
respond to  
**HIGH-QUALITY  
FEEDBACK**



Develop a  
**MENTAL  
MODEL**  
of expertise





# Deliberate Practice



vs.



See, Bernard? Julia's approach was just that tad more sensitive. OK- so who wants another crack at breaking the bad news?



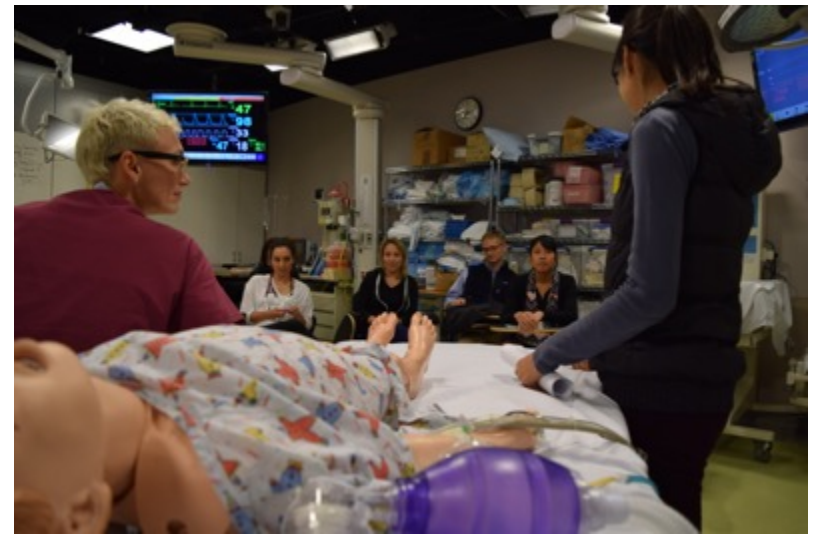
Cartoon by Henry Millard

Practice on real patients.....



....Or fake ones?

# Simulation for practice in healthcare



# What is simulation?

- “To do or make something which looks real but is not real”
  - *Dictionary.com*
- “An educational modality with which the learner physically interacts to mimic an aspect of clinical care for the purpose of teaching or assessment”
  - *Adapted from Cook et al, Med Teach. 2013*

# Simulation for patient care practice: CPR



## Resusci-Anne

THE LIFE-SIZE and LIFE-LIKE MANIKIN for TEACHING and TRAINING of CARDIOPULMONARY RESUSCITATION (CPR)



**VENTILATION**

- Mouth-to-mouth
- Mouth-to-nose
- Mouth-to-adjunct
- Bag/mask

**EXTERNAL CARDIAC COMPRESSION (ECC)**

- Trainee learns
- to feel the carotid pulse
- to check pupils
- to locate pressure point for ECC to avoid injury to patient
- to exert correct amount of pressure on sternum
- timing and ratio of compressions to inflations with one rescuer, or with two rescuers operating together.

**REALISM motivates effective CPR training.**

**RESUSCI-ANNE features:**

- realistic simulation of the human respiratory system
- natural resistance of thorax during ECC
- human appearance with a life-like consistency of skin
- natural mobility of head and jaw
- realistic weight of head and shoulders

Resusci-Anne comes with all necessary equipment contained in one carrying case for ready portability. The body of the manikin can be inflated and all equipment arranged for a teaching and practice session in the course of a few minutes.

Easy cleaning and disinfection makes cross-infection no problem. Furthermore, air exhaled from the manikin after lung inflation is let out through a valve in the neck rather than through mouth and nose, to protect the trainee.

Resusci-Anne is the universally accepted training manikin for CARDIOPULMONARY RESUSCITATION. More than 40 million people in 120 countries have been trained with Resusci-Anne.



# High stakes, rare events



# History taking and physical exam





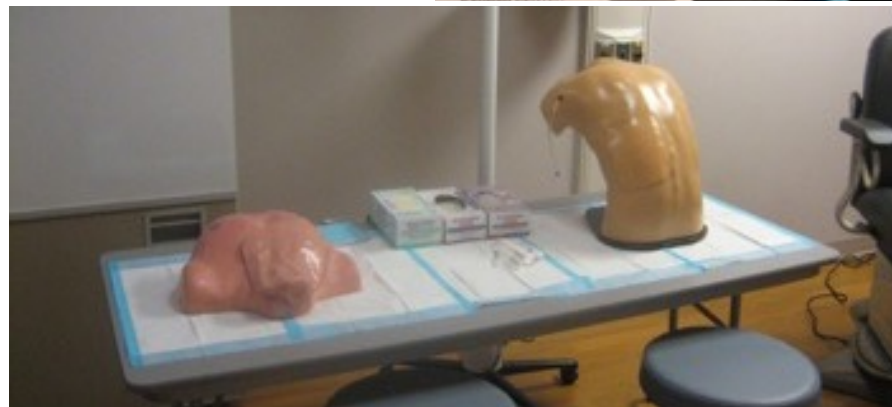
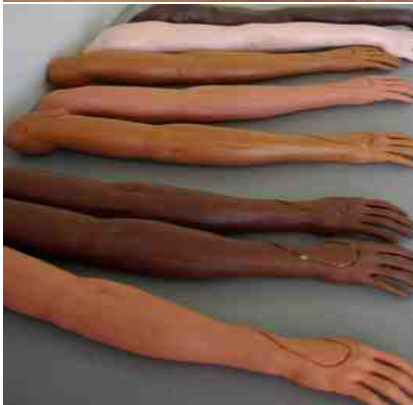
# Simulation: the mannequins





# Simulation: the body parts

## Partial Task Trainers



# Simulation: the actors

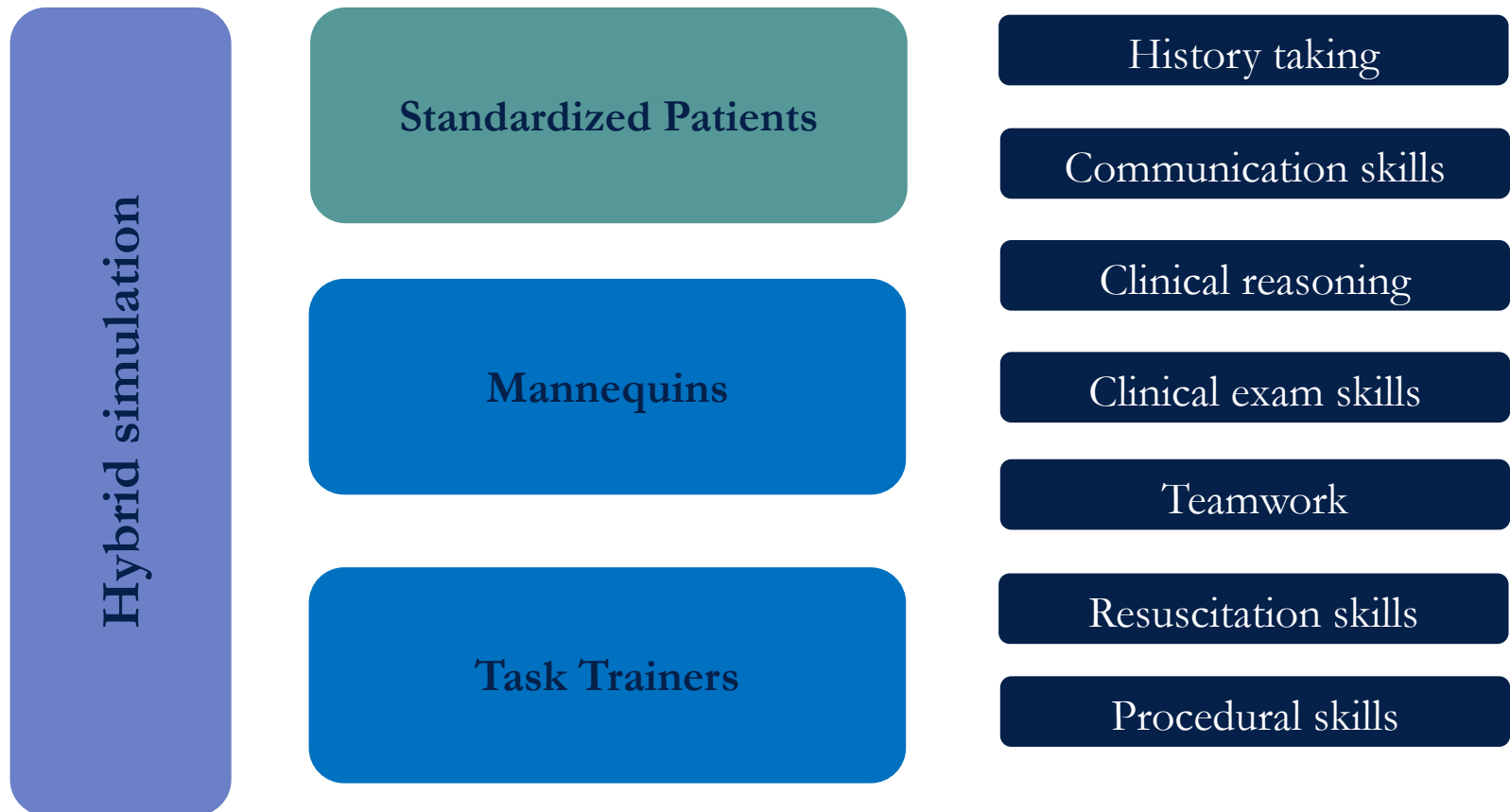
## Standardized patients

- Actors trained to portray patients, and give feedback as a patient



# Which one is best for what?

*Different types of simulation can be used for different educational objectives*



# Hybrid simulation



# Hybrid simulation



# Simulation in health professions education

## **From admission to post-graduation.....**

- Mini-medical interviews with actors (standardized patients)
- History and physical exam
- Procedures – basic and advanced
- Clinical reasoning and management
- CPR and advanced life support training
- Crisis management and team work
- Difficult conversations, ethics, etc.



# Admission interviews

## “Mini-medical interview”

- Brief simulation exercise, typically with actors (SPs)
- Can encompass multiple stations / case scenarios
- Typically focused around ethical decision making, communication skills



medical education  
www.mededuc.com

admissions

**Predictive validity of the multiple mini-interview for selecting medical trainees**

Kevin W Eva,<sup>1</sup> Harold I Reiter,<sup>2</sup> Kien Trinh,<sup>3</sup> Parveen Wasi,<sup>4</sup> Jack Rosenfeld<sup>5</sup> & Geoffrey R Norman<sup>1</sup>

# History taking and physical exam



# Procedural skills



# Clinical reasoning and management



# CPR and advanced life support skills



# Teamwork



# Difficult conversations, ethics, more...



# Limitations: It is simulated, not real

## ”Fidelity”

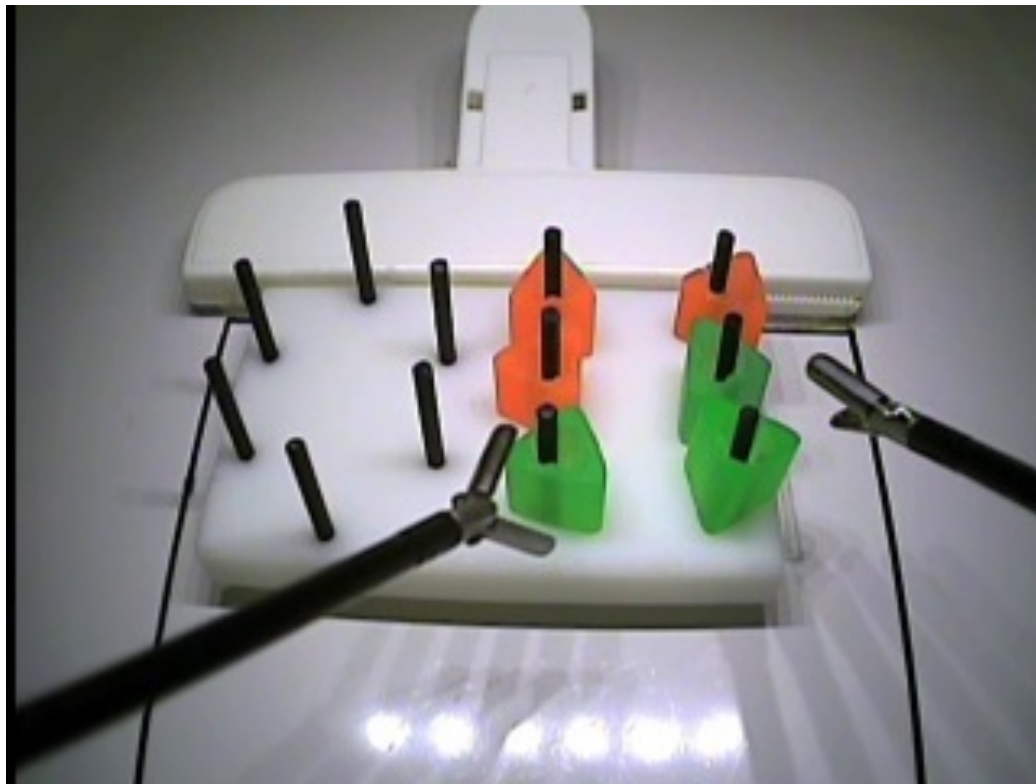
- Equipment
- Environment
- Psychological





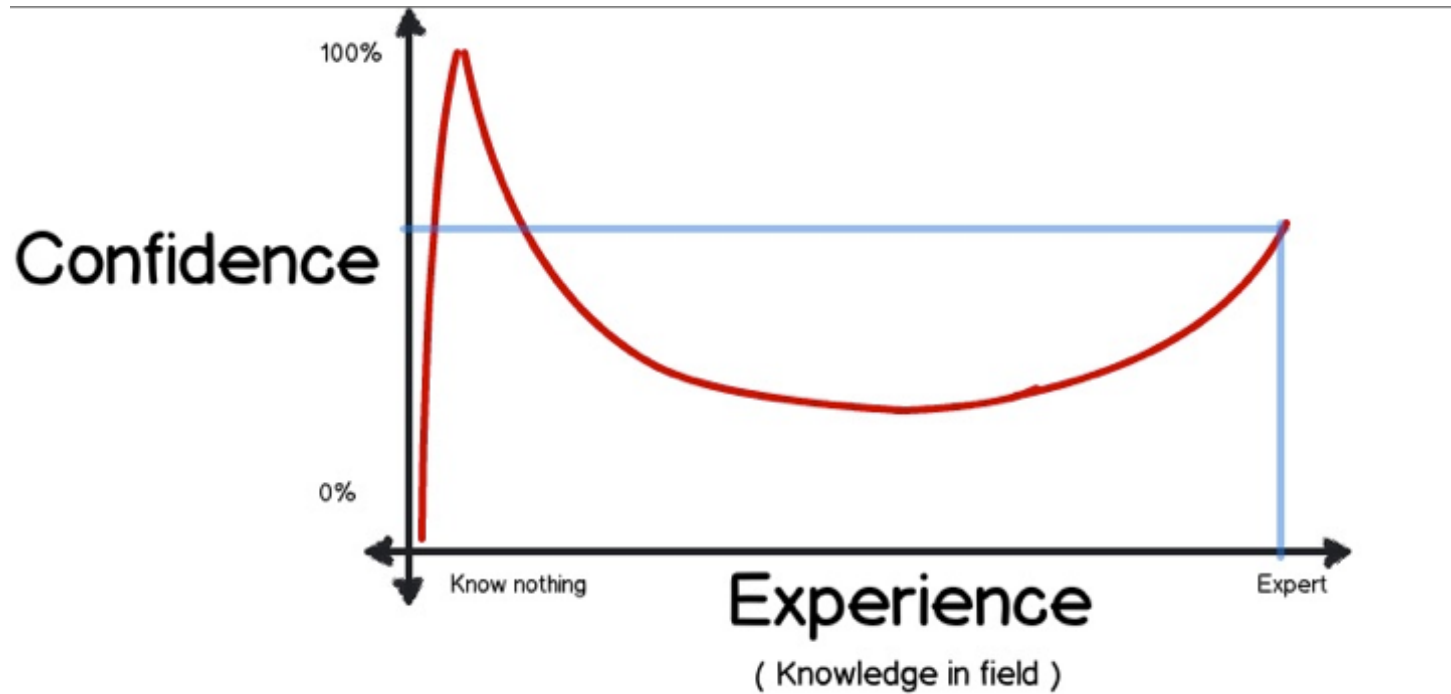
# Fidelity

Or functional task alignment?



# Translation to clinical practice

**If you're competent in simulation, are you competent in real life?**



# Translation to clinical practice

## Evidence from the literature



CHEST

Original Research

EXPERIENTIAL LEARNING

### Simulation-Based Education Improves Quality of Care During Cardiac Arrest Team Responses at an Academic Teaching Hospital\*

#### A Case-Control Study

*Diane B. Wayne, MD; Aashish Didwania, MD; Joe Feinglass, PhD; Monica J. Fudala, BA; Jeffrey H. Barsuk, MD; and William C. McGaghie, PhD*

#### ORIGINAL INVESTIGATION

### Use of Simulation-Based Education to Reduce Catheter-Related Bloodstream Infections

*Jeffrey H. Barsuk, MD; Elaine R. Cohen, BA; Joe Feinglass, PhD; William C. McGaghie, PhD; Diane B. Wayne, MD*

**Background:** Simulation-based education improves procedural competence in central venous catheter (CVC) insertion. The effect of simulation-based education in CVC insertion on the incidence of catheter-related bloodstream infection (CRBSI) is unknown. The aim of this study was to determine if simulation-based training in CVC insertion reduces CRBSI.

**Methods:** This was an observational education cohort study set in an adult intensive care unit (ICU) in an urban teaching hospital. Ninety-two internal medicine and emergency medicine residents completed a simulation-based mastery learning program in CVC insertion skills. Rates of CRBSI from CVCs inserted by residents in the ICU before and after the simulation-

based educational intervention were compared over a 32-month period.

**Results:** There were fewer CRBSIs after the simulator-trained residents entered the intervention ICU (0.50 infections per 1000 catheter-days) compared with both the same unit prior to the intervention (3.20 per 1000 catheter-days) ( $P = .001$ ) and with another ICU in the same hospital throughout the study period (5.03 per 1000 catheter-days) ( $P = .001$ ).

**Conclusions:** An educational intervention in CVC insertion significantly improved patient outcomes. Simulation-based education is a valuable adjunct in residency education.

*Arch Intern Med.* 2009;169(15):1420-1423



# Limitations: Resource intensive

## Time, people, equipment, space

- How to do this most effectively and efficiently?
- Can you learn from watching others?
- What equipment helps achieve the best learning?



# UCSF Simulation Center







The screenshot shows a video player interface. The main video area is split into two panels. The left panel shows a medical simulation with a patient on a gurney and several healthcare providers. The right panel shows a group of healthcare providers sitting around a table, engaged in a debriefing session. On the right side of the video player, there is a patient monitor interface with the following data:

- HR: 102
- SpO<sub>2</sub>: 98
- etCO<sub>2</sub>: -?-
- CO<sub>2</sub> No Sensor (Touch when sensor connected)
- NBP Manual: 149/77 (101)
- Pulse: 101
- awRR: 12
- Tblood: 37.2

At the bottom of the video player, there is a play button, a progress bar, and an "Annotate" button.







# UCSF Standardized patients

- UCSF has a large SP pool: 150-200 active SPs
- Most are professional actors (supplemental income)
- For many more than “just a side job”
- Regional & national organizations



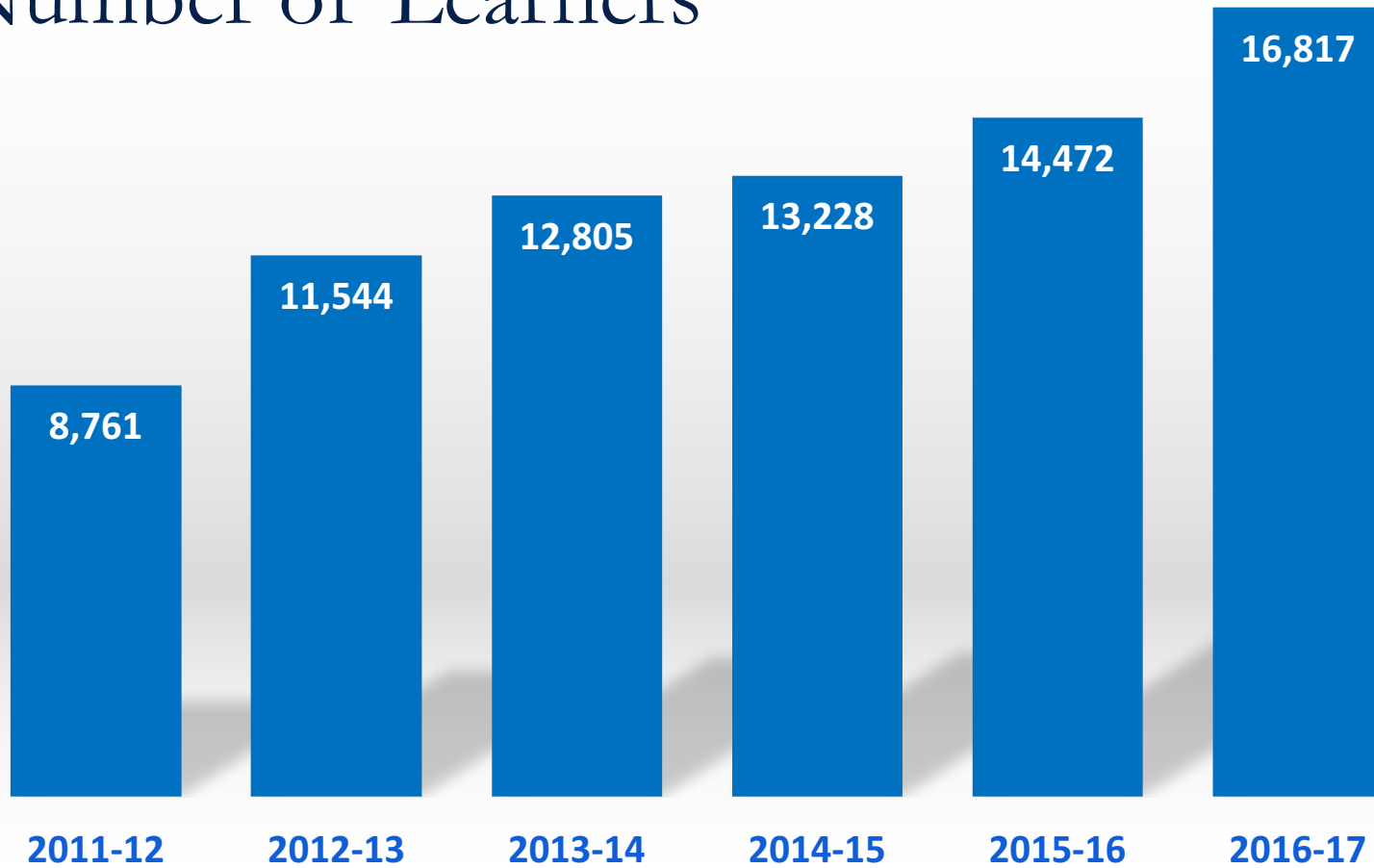
## Core Curriculum

ASPE's Core Curriculum provides education on fundamental knowledge and skills for Standardized Patient Educators. The Core Curriculum is intended to inform educators on best practices education, grounded in ASPE's standards of practice.

Modules Include:

- Foundations of SP Methodology – Best Practices and Essential Skills
  - History of SP Methodology
  - Case and Checklist Development
  - Training Standardized Patients
  - Feedback Techniques
  - Techniques to Debrief SPs
- Foundations of SP Methodology – Best Practices in Administration
  - Recruiting, Interviewing and Maintaining
  - Strategic Management of an SP Program
  - Designing Policies and Procedures
  - Knowledge Management & Data Considerations

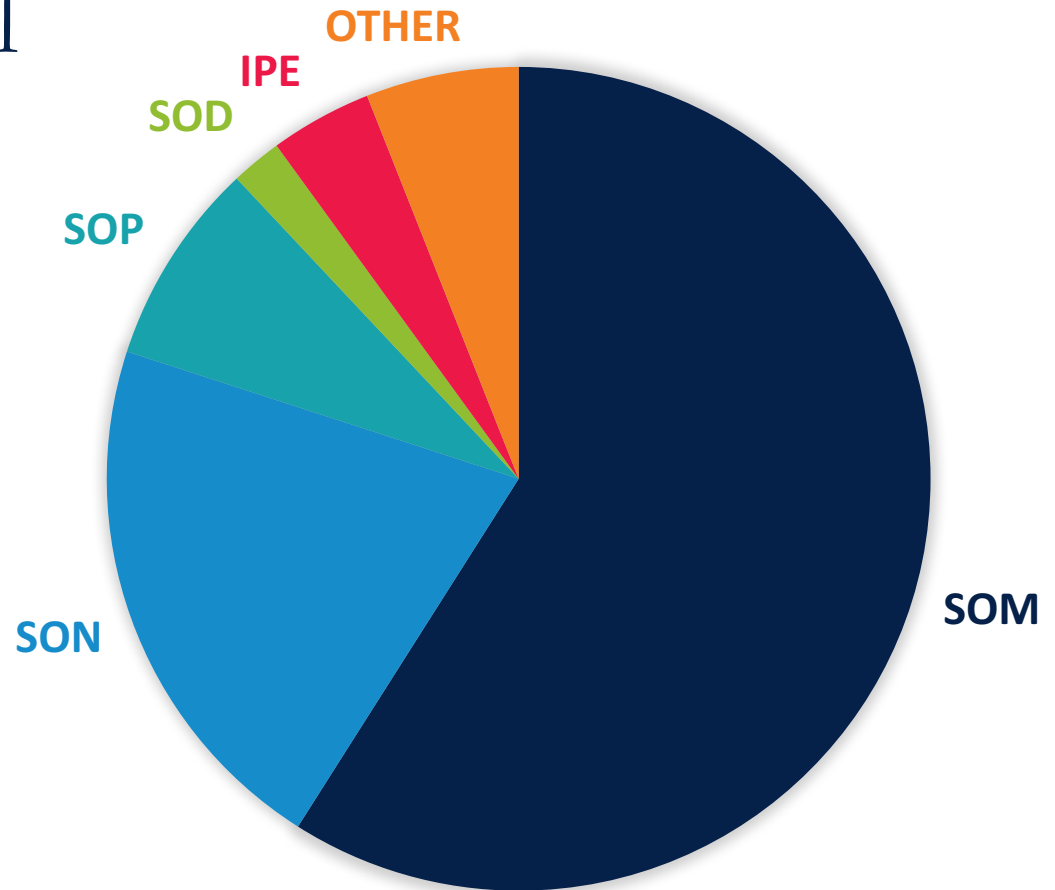
# Number of Learners



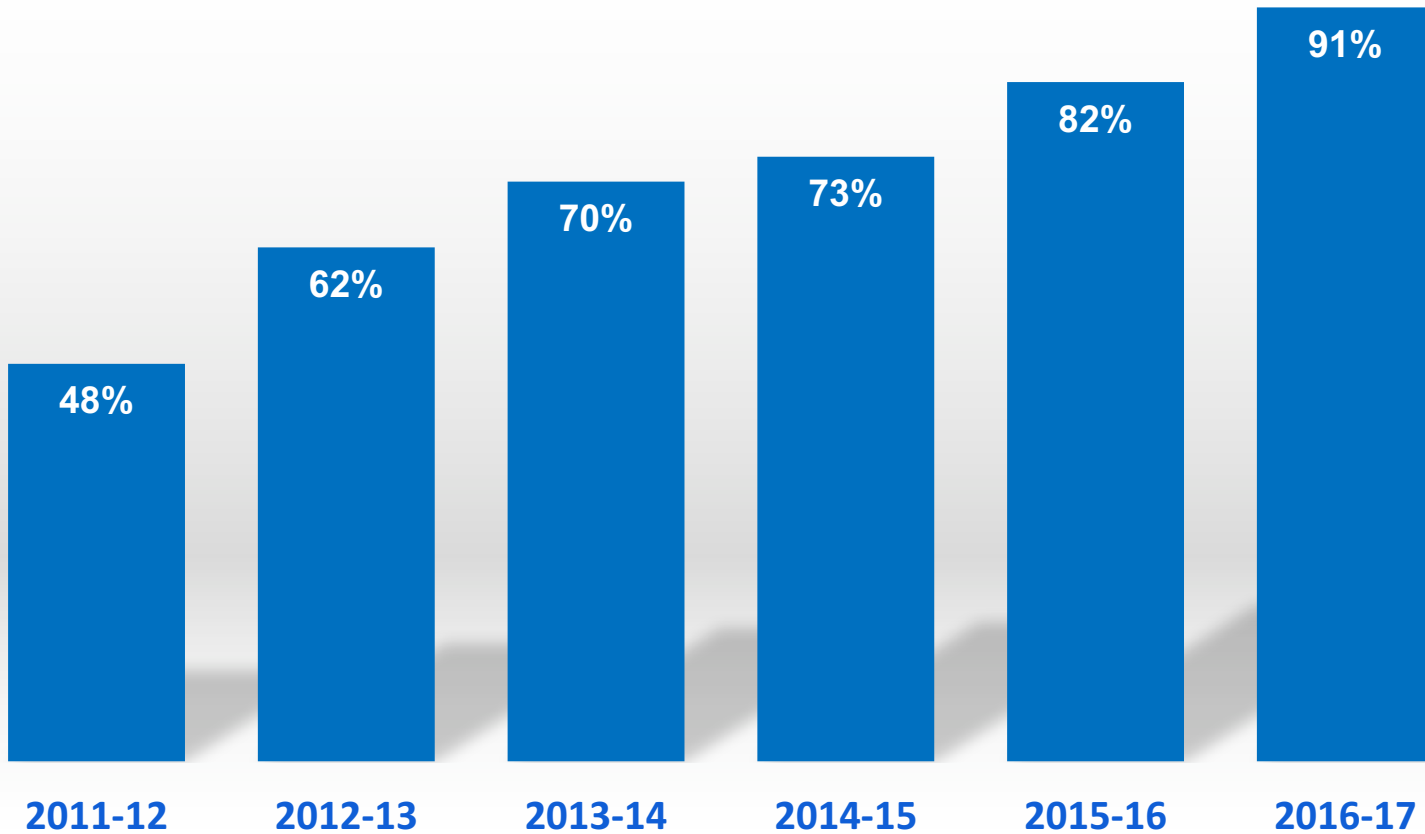
# Learners by School

- SOM** School of Medicine
- SON** School of Nursing
- SOP** School of Pharmacy
- SOD** School of Dentistry

**IPE** Interprofessional Education



# Utilization



# Affiliated programs

- UCSF Benioff Children's Hospital "Mock Code" Program
  - Every unit in the children's hospital
  - Interprofessional
  - More than 60 sessions per year

# Summer Intern Program



# UCSF Simulation and the community

## Outreach, research, education



### ▪ *Connections within UCSF:*

- Faculty development, simulation fellowship, research

### ▪ *Connections with other simulation centers:*

- UC consortium, membership in California Simulation Alliance

### ▪ *Connections with community:*

- American Heart Association CPR training (in partnership with UCSF PD)
- Summer intern program and other outreach



# Summary

- Simulation refers to a variety of educational strategies to help learners in the health professions acquire patient care skills
- Powerful strategy to allow for repeated practice, feedback, gradual increase in mastery
- Allows for exposure/experience with low frequency, high stakes events
- Safe for patients, safe for learners
- Can prepare for, but can't replace real life practice



**Questions?**

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