# Simulation

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# Intended Learning Outcomes

- Understand the variety of simulations used in health professions education
- Define the necessary components of a well-constructed simulation

# Why are simulations useful?

- Learner-centered activity, experiential
  - Confidence
  - Competence
  - Safe for all parties involved
- Reproducible, standard setting for a team
- Rare clinical scenarios or procedures
- Training and rehearsal
- Formative and summative assessments

# Simulations vary by domain

- Skill domains
  - Task trainers, surgical trainers, standardized patients
- Cognitive domains
  - Problem-based, patient-based, “table-top” exercises
- Affective domains
  - Teamwork, leadership, communication

# Common elements

- Intentional **outcomes** that can be measured
- Fidelity: high versus low. Does it matter?
- Deliberate practice
- Reflection/de-brief
- Feedback

McGaghie, Issenberg, Petrusa, and Scalese. *Medical Education*. 2010. 44: 50-63.

# Outcomes

- Clear metrics or rubrics
  - Time on task
  - Accuracy
  - Communication
  - Patient outcome
- Transferable
- Persistence or retention

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# Fidelity





# High versus Low

- Assumptions about high fidelity simulators center around authenticity
  - Task is similar or as close to real-world as possible
  - Higher authenticity means 'better' transfer
- When each is compared to a no-intervention group, both hi/low sims show impact on performance
- However, when compared to one another there is minimal advantage

Norman, Dove, and Grierson. *Medical Education*. 2012. 46(7):636-647

# Go High or Go Low?

- Consider cost, access, intended outcomes
- Progressive fidelity
  - Low: Novice and High: Expert
- Be creative! Use easy to obtain items
  - Butcher, craft stores, gelatin
- Too much cognitive complexity can distract from the task

Norman, Dove, and Grierson. *Medical Education*. 2012. 46(7):636-647

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# Deliberate Practice

- Goal is to develop expert performance
- Identify recognizable components of desired task or cognitive activity
- Consciously practice, repeat, practice, repeat
  - "10 years, 10,000 hours"
- Establish connections, memories, automaticity

Ericsson KA. *Acad Med* 2004;79 (Suppl 10):70-81

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# Reflection on performance

- Purposeful review of thoughts, process, outcomes
- Supportive environment
- Identify opportunities for improvement
- Debriefing the team

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# Feedback

- Variety of sources both during and after
  - Haptics
  - Participants, observers, patient, equipment data
- Videotaping, audiotaping
- Checklists or global rating scales

# Summarize…

- Sims vary
- High/low
- Formative
- summative

# On-line resources

- **McGaghie WC, Issenberg SB, Petrusa ER, Scalese RJ.**

**A critical review of simulation-based medical education research: 2003–2009.** Med Ed. 2010. 44(1). p 50-63. Article first published online: 16 DEC 2009 DOI: 10.1111/j.1365-2923.2009.03547.x
http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2923.2009.03547.x/full
(free on-line access)

- **Norman G, Dore K, Grierson L.**

**The minimal relationship between simulation fidelity and transfer of learning.** Medical education. 2012. 46(7). pages 636-647. Article first published online: 23 MAY 2012 DOI: 10.1111/j.1365-2923.2012.04243.x
http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2923.2012.04243.x/abstract
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