Using Limited Fidelity, High-volume Simulations To Enhance Nursing Annual Skills Validations

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Objectives

- By the end of this presentation, participants will be able to:
  - Describe the INEx approach to learning
  - Discuss the benefits of using limited fidelity simulation for a high-volume of learners
  - Describe the outcomes of utilizing this approach for Nursing Annual Skills Validation
About Us…UCSF

- Located in the heart of San Francisco, California, USA
- Quaternary Care Facility located on 3 campuses with patient care
  - 1000+ beds
- Part of the University of California educational system (10 campuses, 5 have associated medical centers)
- UCSF is unique in that it is a health sciences campus only
The UCSF Medical Center Institute for Nursing Excellence (INEx) is a department that supports Nursing education, research, and practice.
INEx Team

- Clinical Nurse Educators (CNE)
- Clinical Nurse Specialists (CNS)
- Clinical Nurse Researchers (CNR)
- Clinical Research Librarians
- Simulation Specialist
Dreyfus Model of Skill Acquisition

As one gains expertise, there is a shift...

- From reliance on abstract principles and rules to the use of past concrete experiences and intuition
- From one in which the situation is seen as a compilation of equally relevant bits to a complex whole in which only certain parts are relevant
- From being a detached observer to one who is involved and fully engaged in the situation
In essence, all practitioners move through stages of skill acquisition in the course of their career:

- Novice/Adv. Beginner: Mastering the task world
- Competent: Can handle the expected workload
- Expert: Response-based practice

Clinicians at different stages of skill acquisition literally live in different clinical worlds.
The Zig and Zag of Expertise
UCSF Nursing Annual Requirements

- Required hands-on training for all nurses annually
  - Regulatory compliance
  - Review of P&SSs
  - High-risk, low volume
Previous Nursing Annual Review Structure

- Focused on required regulatory elements
- One-size-fits most (same content for all units)
- Didactic teaching methods
  - Skills stations
  - Education by general means
INEx Annual Skills Validation (ASV)

- How can we make it better?
  - Staff
  - Educators
- Zig and Zag
- Limited resources
- Use simulation but how?
High-Fidelity Simulation Practices

Typical ‘immersive’ simulations at UCSF (and elsewhere)

- High-fidelity simulator mannequin
- No instructor in the room
- Learners – 2-3 maximum at a time
- Staff/student ratio – 1:3 or 1:2
  - Educator(s)
  - Sim tech
- Video used in scenario debriefing
ASV Learner Needs

- Adult Acute Care 922
- Adult Critical Care 538
- Adult Infusion 46
- PACU 155
- Endoscopy 23

- Peds Acute Care 323
- Peds Critical Care 21
- PICU/CICU 156
- Birth Center 58
- ICN 233

Total = 2475 nurses
ASV Scheduling

- How can we put large numbers through simulation?

  - If only 2 nurses per ASV simulation (highest fidelity)
    - 3-4 sim groups per session
    - 8 staff
    - 3 sessions per ASV day
    - =18-24 nurses per ASV day
    - 103 ASV days per year

  - If 6 nurses per simulation (limited fidelity)
    - 4 groups per session
    - 5-6 staff
    - 3 sessions per ASV day
    - = 54-72 nurses per ASV day
    - 34 ASV days
How to increase learner volume?

- Short, limited-fidelity simulations
- Large simulation groups (6-8)
- CNE Facilitator in the room
- Debriefing at bedside to save time
- Automated simulator responses
- No video feedback
- Cross-training CNEs for coverage
  - Adult/pediatric
  - Acute care/critical care
Simulation Fidelity


- “Unfortunately, many within the training community have begun to use the terms simulation and high fidelity simulation almost synonymously.”
  - Overemphasizes instructional technology
  - Perpetuates myths:
    - Simulation fidelity is unidimensional
    - Higher levels of simulation fidelity lead to increased training effectiveness
  - “Technology-based typologies invariably become outdated as technologies evolve over time.”
High-Fidelity Simulation - Aviation

Dimensions of Fidelity (Rehmann et al, 1995)

- **Equipment fidelity** – “degree to which simulator duplicates appearance and feel of real system.”

- **Environment Fidelity** – “extent to which the simulator duplicates motion cues, visual cues, and other sensory information from the task environment.”

- **Psychological fidelity** - “degree to which the trainee perceives the simulation to be a believable surrogate for the trained task.”
Literature – fidelity vs effects

- What level of fidelity is necessary?
- Kim, Park, and Shin (2016) – meta-analysis of 40 nursing simulation studies

  - Sought to compare effect sizes in simulation education interventions to fidelity level

  - Concluded effect in simulation interventions was not proportional to fidelity level

  - Found similar effect sizes for high- and medium-fidelity simulations
Move to Simulation-Based ASV

- Customized content for specific populations
  - Critical vs acute care
  - Adult vs pediatric
- Rotate through skills stations and scenarios
- Programmed simulator responses for:
  - Time in sim, time in state
  - Learner action (drugs given, defibrillation, etc.)
- Fun themes to help engage learners
Determined content by:

- Regulatory requirements (TJC, DHS, CMS)
- Collaboration with unit managers and CNSs
- Needs assessments
- Internal Safety and Quality metrics
Skills reviewed in all ASV scenarios

- Shift report-out
- Electronic charting
  - APeX patients created for simulations
  - Workstation for charting at bedside
- Communication with team and providers
- Medication administration
Roles in ASV Simulations

- Not all learners must do all specific tasks
- Benefit from observer-participation in room
- Departure from remote (video) observations
In-room observation

- O’Regan et al. (2016) Observer roles that optimise learning in healthcare simulation education: a systematic review
  - Reviewed nine studies on learning outcomes for observers vs. hands-on participants in simulation training
  - 5/9 studies suggested that learning outcomes were as strong in observers as in hands-on roles.
- Learner engagement a better gauge of outcome than observer vs hands-on role
ASV Simulation Scenarios

- Resuscitation (code blue, code white)
- Trach care
- Code Seizure
- Epidural site assessment
- Malignant Hyperthermia (PACU and Endoscopy)
ASV Skills stations

- Medium-fidelity and hybrid skills stations
  - Point of care testing
  - Restraints
  - Blood cultures
  - Pumps
  - Pleurex drainage
  - CVC dressing change
  - Defibrillator
  - Port placement and care
**Introduction to Simulation:**
- Talk & think out loud so others can track your clinical reasoning & so instructors can hear you
- We’re not trying to trick you! i.e. pt name, expiration dates etc.
- Act out everything as you normally would in real life, unless indicated i.e. making phone calls
  - Do not actually administer medications into mannequin
  - Alaris pumps are not actually infusing, but verbalize when changes are made etc.
  - Defibrillation pad cable has been cut, place pads and use alternative cable (ok to shock mannequin)
  - The mannequins are heavy, please use caution when moving them
  - Supplies are on table or in supply area
  - Assign Roles: Primary RN, Podmate, Charge RN, family member (during code only)

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<tr>
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<td>Admit Dx: s/p R hepatectomy, cholecystectomy</td>
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**State 1: Initial Assessment (patient stable)**

1. Report given
2. Assess patient
3. CNE: Sedation is off at beginning (show MAR)
4. CNE: Order to leave on Index (all transfusion orders): Benadryl, Lasix, transfuse, prepare, transfusion reaction

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**Transition to next state after: Initial Assessment**

**State 2: Sedation Wake-up (SWU)**

1. Assess patient (mannequin can’t move, use sign)
   a. RASS 2+, CPOT 6, pt agitated
2. Restart Propofol (RASS) & document
3. Restart Fentanyl (CPOT) & document
   a. Restart at ¼ the previous doses
4. Document in APeX from MAR window not VS

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**Transition to next state after: VS & Sedation Assessed; Propofol & Fentanyl restarted or PRN doses given**

**State 3: Sedation Intervention: Pt Improves**
In-room facilitation and debriefing
ASV Theme – Ninja Turtles
ASV Theme – Star Wars
Was it effective?

- And how do we know?
- Evaluations
  - “Did you like?”
  - Self-assessment
INEx ASV Evaluations

Completed online after ASV sessions

- Rated as excellent, good, average, fair, or poor
- General interest in content
- Content Applicability in practice
- Instructor preparation, organization, clarity, enthusiasm, response
- Most/least helpful part of the activity
- Suggestions for future ASV topics
- Additional comments/suggestions

All items rated ‘Excellent’ or ‘Good’ by almost all respondents
ASV Evaluation Comments

Learner self-assessment comments

- “I am more confident with trach care.”
- “Loved the code – feels good to review crash.”
- “Chest tube confidence up.”
- “Better knowledge and preparedness for chest tubes.”
- “Hands on aspect of different scenarios was great way to learn.”
- “I feel more prepared and comfortable.”
- “Going through the hands on helps to remember what to do.”
- “More comfortable and knowledgeable in all areas practiced.”
Challenges

- Resource Intensive
- Too popular – units want tailored to them
- Facilitator training (cross-training, e.g., ICU)
- Sustainability of practice
- Educator load
  - Other ed. Programs, etc.
- Simulator and lab maintenance
Moving forward

- Evaluate how to conduct ASV using less resources
- Move some activities out of ASV and smaller quarterly classes
  - Deeper, higher fidelity simulation
- Continue collecting metrics to support efforts
Resources


Questions?