Screen-Based Simulation: Pathway to Clinical Judgment

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Learning Outcome
On successful completion of this program, the participant will be able to:

- Describe screen-based simulation and clinical judgment
- Identify how screen-based simulation can facilitate development of clinical judgment
- Discuss strategies for incorporating screen-based simulation into the nursing curriculum to create a pathway toward clinical judgment
What is Screen-Based Simulation?

- Screen-based simulations (SBSs)
  - Use digital technology to represent patients, populations, or other healthcare encounters on a computer screen or a mobile tablet, smartphone, or other screen-based device (Chang, Gerard, & Pusic, 2016) to impart knowledge (Durmaz, Dicle, Cakan, & Cakir, 2012)
- Examples of SBSs
  - Virtual patients
  - Virtual worlds
  - Screen-based haptic trainers
  - Resource management simulators

Screen-Based Simulation in the Nursing Curriculum

- **Advantages**
  - Software infinitely replicable
  - Portability – access whenever, wherever
  - Asynchronous access - live instructor not required
  - Accommodating to individual pace of learning
  - Software can be distributed to many devices
  - Ability to track massive amounts of data
  - More cost effective than other types of simulation
- **Disadvantages**
  - Lack functional fidelity
  - Upfront cost of programming and development
  - Technical problems

(Chang & Weiner, 2016; Chang, Gerard, & Pusic, 2016; Durmaz, Dicle, Cakan, & Cakir, 2012; Roh & Kim, 2014)

**Key Considerations:** Objectives matter! Make sure to fit the learning outcomes with the best modality
Vision for the Future

Continuum of Learning

Class → Simulation → Clinical → Real world

- Bridging the gap requires integration of simulation into mainstream healthcare education

TRANSITION TO CLINICAL JUDGMENT

Clinical Judgment

Clinical Reasoning

Critical Thinking
Critical Thinking

- All or part of the set of thinking skills used when analyzing client issues and problems
  - Interpretation
  - Analysis
  - Evaluation
  - Inference
  - Explanation
  
  (Facione, 1990; AACN, 2008)

- Facilitates critical analysis of an issue

- Requires student/nurse to be able to:
  - Think abstractly
  - Generalize/transfer information
  - Apply knowledge to client situations
  
  (Peden-McAlpine & Clark, 2002)

CLINICAL REASONING

- Mental process used when analyzing and evaluating all elements of a clinical situation and deciding on the best action (Tanner, 2006)

- The recognition and collection of relevant data, taking the right action, at the right time (Levett-Jones, 2010)

- The ability to reason as a clinical situation changes (Benner, Sutphen, Leonard, & Day, 2010)

- Collect critical data related to clinical situation
- Evaluate and reflect on outcome(s) of interventions
- Analyze and evaluate data
- Determine what is relevant and what is not
- Consider various interventions and possible outcomes
- Implement selected interventions(s)
CLINICAL JUDGMENT

- Interpretation or conclusion about a patient’s needs, concerns, or health problems, and/or the decision to take action (or not), use or modify standard approaches, or improvise new ones as deemed appropriate by the patient’s response
  
  *(Tanner, 2006)*

- Clinical judgment requires clinical reasoning across time about the particular, and because of the relevance of this immediate historical unfolding, clinical reasoning can be very different from the scientific reasoning used to formulate, conduct, and assess clinical experiments
  
  *(Benner, Hughes, & Sutphen, 2008)*

Creating a Pathway to Clinical Judgment

**Critical Thinking**
All or part of the process of questioning, analysis, synthesis, interpretation, inference, inductive and deductive reasoning, intuition, application, and creativity *(AACN, 2008).*

**Clinical Reasoning**
Clinical reasoning is the ability to reason as a clinical situation changes, taking into account the context and concerns on the patient and family *(Benner, Sutphen, Leonard, & Day, 2010).*

**Clinical Judgment**
An interpretation or conclusion about a patient’s needs, concerns, or health problems, and/or the decision to take action (or not), use or modify standard approaches, or improvise new ones as deemed appropriate by the patient’s response *(Tanner, 2006).*
Screen-Based Simulation and Healthcare Education

Recommendations from the Literature

- Can be used to evaluate competency and knowledge attainment and provide feedback related to clinical knowledge and critical-thinking skills (Durmaz, Dicle, Cakan, & Cakir, 2012)

- Simulation-based educational programs need to be integrated into clinical education and practice to maximize the effectiveness of simulation in developing students' clinical judgment skills (Lasater, 2010)

- Early introduction of virtual patient-based assessment with self-evaluations led to student identification of clinical reasoning, clinical practice focus, and clinical competence expectations" (Forsberg, Ziegert, Hult, & Fors, 2016)

Using Best Practices in Simulation to Foster Clinical Judgment

INACSL Standards of Best Practice: Simulation℠

**Phase I: Planning and Pre-Briefing**
- Criterion 1: Needs Assessment
- Criterion 2: Measurable Objectives
- Criterion 10: Participant Preparation
- Criterion 7: Prebriefing

**Phase II: Scenario Implementation**
- Criterion 3: Format of Simulation
- Criterion 4: Clinical Scenario or Case
- Criterion 5: Fidelity
- Criterion 6: Facilitative Approach

**Phase III: Debriefing and Evaluation**
- Criterion 8: Debriefing
- Criterion 9: Evaluation
- Criterion 11: Pilot

(INACSL Standards Committee, 2016)
Evidence to Support Screen-Based Simulation Integration

*Paving the Way to Clinical Judgment*

- **Computer-based simulation** could be used in a targeted role as complementary learning tools (Roh & Kim, 2014)

- Engaging in **authentic** nursing activities using **interactive multimedia** Web-based simulation can enhance nurses’ **competencies** in acute care (Liaw, Wong, Chan, Ho, Mordiffi, Ang, … Ang, 2015)

- Nursing students’ use of **virtual patients (VPs)** provides learning activities to support development of nursing **knowledge** and **theory-practice integration** (Georg & Zary, 2014)

Strategies to Support Integration of Screen-Based Simulation

*Paving the Way to Clinical Judgment: Case Studies*

- Pre-constructed web-based case studies
  - Using a **variety of instructional activities** including animation video, multimedia instructional material, virtual patient simulation and online quizzes through **intentional content delivery** focusing on **analysis, strategy, and evaluation** in the instructional design (Liaw, S. Y., Wong, L. F., Chan, S. W.-C., Ho, J. T. Y., Mordiffi, S. Z., Ang, S. B. L., … Ang, E. N. K., 2015)
Strategies to Support Integration of Screen-Based Simulation

*Paving the Way to Clinical Judgment: Scaffolding Curriculum*

- **Scaffolding learning across the curriculum**
  - Use same simulation scenario (client or environment) with different focus
    - Begin with basics within patient care context
    - Build upon prior learning to extend understanding
    - May include progression of topic in different settings
      - i.e. nursing actions leveled across courses
- **Complex Health**
  - Coordination of Care
- **Mental Health**
  - Interprofessional Collaboration
- **Maternal Newborn**
  - Teamwork
- **Pediatrics**
  - Delegation
- **Adult Health**
  - Prioritization
- **Foundations**
  - Communication

(Leighton, 2018)

**Strategies to Support Integration of Screen-Based Simulation**

*Paving the Way to Clinical Judgment: Multiplayer Experiences / Virtual Hospital*

- **Multi-player screen-based simulation using game-based technology to allow multiple students to enter the patient-care environment and provide collaborative care**
  - Provides mental rehearsal and participants identified improved confidence and ability to perform psychomotor tasks *(Taekman, et al., 2017)*
  - *Example*: Facilitator-led simulation with student participation using keyboard, mouse and voice-over IP headsets with microphones to facilitate teamwork and collaboration

(Taekman, et al., 2017)
A Pathway to Clinical Judgment: Screen-Based Simulation

**Takeaways**

- Employs learning tools as instructional strategies that engage students in a more realistic manner
- Provides a safe environment for learning and fosters mental preparation
- Supports educators in creating opportunities to apply clinical judgment to practice situations
- Enhances development of clinical competencies to make clinical judgments that closes the gap between theory and practice

Contact Information

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References


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