Shadow Health Lab
with Virtual Reality

Bringing the Healthcare Simulation Standards of Best Practice® to life through Shadow Health Lab with Virtual Reality

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Executive summary

The Healthcare Simulation Standards of Best Practice® (HSSOBP) emphasize the importance of psychologically safe, competency-based, and evidence-informed simulation experiences across healthcare education. The standards identify several foundational elements of high-quality simulation to support competency-based education and professional integrity, including intentional design, prebriefing, facilitation, and debriefing. Together these elements support the development of clinical judgment, patient safety, communication, and reflective learning.

As nursing programs continue to face challenges such as clinical placement shortages, limited faculty resources, inconsistent learner experiences, and growing competency expectations, immersive virtual reality (VR) simulation offers a scalable, evidence-aligned approach to simulation-based education.

Shadow Health Lab with Virtual Reality (Shadow Health Lab with VR) was intentionally designed to provide learners with immersive, facilitator-guided simulation experiences aligned with simulation best practices. Through realistic patient encounters, structured facilitation, psychologically safe learning environments, and competency-based progression, Shadow Health Lab with VR supports nursing programs in expanding access to high-quality simulation while maintaining alignment with the HSSOBP framework.

Introduction

Healthcare simulation has become an increasingly prevalent and effective strategy for supporting clinical readiness in nursing education. The HSSOBP were developed to guide the integration, use, and advancement of simulation-based experiences across healthcare education and practice. The standards emphasize evidence-informed simulation design, learner safety, faculty development, and reflective practice. They also explicitly recognize virtual simulation as a modality to which the standards apply alongside manikin-based simulation, standardized patients, and online simulation methodologies (INACSL Standards Committee, 2021).

At the same time, nursing programs continue to face significant operational and educational challenges, including clinical placement shortages, lack of diverse clinical experiences, faculty workload and staffing limitations, increasing expectations for competency-based education, and limited opportunities for active participation in traditional simulation.

Traditional simulation remains highly valuable but can be resource-intensive, requiring extensive setup time, facilitator preparation, equipment maintenance, and physical simulation space. Due to the constraints, in many traditional simulation experiences, learners may rotate through roles such as observer, assistant, or family member, limiting the number of opportunities each student has to independently practice clinical judgment.

Shadow Health Lab with VR was developed to address these gaps by placing every learner in an active nursing role within diverse, immersive patient care experiences. Through facilitator-guided VR simulation, learners actively engage in patient assessment, communication, prioritization, escalation of care, and clinical decision-making within formative learning environments designed to support competency development. For nursing faculty and simulation coordinators, Shadow Health Lab with VR offers a streamlined and less labor-intensive option for realistic patient simulations that complement existing experiences such as traditional simulations, skills lab, and clinical placement.

The educational philosophy behind Shadow Health Lab with VR

Shadow Health Lab with VR was designed around several foundational educational principles, including experiential learning, constructivist learning theory, competency-based education, and reflective practice. The platform was intentionally developed to support active learner participation and clinical judgment development through immersive patient care experiences.

Learners are required to assess patients, recognize cues, prioritize interventions, communicate with providers and family members, escalate care when appropriate, and evaluate patient responses to interventions. Learners will experience different patient outcomes based upon their assessment, judgment, and decision-making. This provides them with the opportunity to recognize the impact of their clinical judgment (good or bad) based on patient outcomes.

The product also aligns with competency-based education principles by scaffolding learners through progressively complex patient scenarios ranging from novice-level encounters with stable patients to advanced leadership encounters with multiple patients. This progression allows learners to build confidence and competency over time while engaging in deliberate practice. When compared to the manual and time-consuming nature of shifting from one scenario to another in traditional manikin-based simulation, requiring changing manikin parts, adding or removing moulage, and preparing different equipment, Shadow Health Lab with VR can pivot from one patient case to another with a few clicks on the computer, making it a much more convenient option when providing simulation experiences to learners who are progressing at different speeds.

The platform's design and development was defined by the Clinical Judgment Measurement Model (CJMM) and student learning outcomes. Core competencies intentionally targeted within the platform include:

- Clinical judgment and clinical reasoning
- Patient assessment
- Prioritization
- Therapeutic communication
- Patient and family education
- Patient safety
- Teamwork and delegation
- Escalation of care

Unlike many autonomous VR learning experiences, Shadow Health Lab with VR was intentionally designed as a facilitator-guided simulation platform. This means that, like in traditional high-fidelity simulation, the facilitator remains central to learning before (preparation and briefing), during (supplementing certain dialogue and patient actions and selecting scenario pathways based upon learner performance), and after (debriefing) each experience.

Alignment with the Healthcare Simulation Standards of Best Practice

Professional integrity and psychological safety

The HSSOBP Professional Integrity standard emphasizes psychological safety, learner support, inclusion, confidentiality, professionalism, and ethical simulation practice. Shadow Health Lab with VR supports psychologically safe learning by allowing students to practice clinical decision-making in immersive environments where no real patients can be harmed. Learners are given opportunities to make mistakes, reflect on outcomes, and improve performance through facilitator-guided debriefing.

Rather than emphasizing punitive evaluation, the platform focuses on formative learning and reflective practice. Learners are not penalized for mistakes within the simulation experience. Instead, facilitators use observed learner behaviors, transcripts, and reflective questioning to guide discussion and clinical reasoning during debriefing.

Shadow Health Lab with VR helps to reduce learner anxiety compared to traditional peer-observed simulation settings, as learners often report perceiving VR experiences as less intimidating than simulation laboratories where peers and observers are physically present. This may be especially valuable for hesitant, reserved, or less confident learners who may participate less actively in traditional simulation environments. Shadow Health Lab with VR places every learner in the active nursing role. Unlike some traditional simulation experiences where learners rotate through observational or support roles, each learner independently engages in patient assessment, communication, prioritization, and clinical decision-making.

The platform also supports equitable access to clinical experiences. Students across programs and clinical sites using Shadow Health with VR receive consistent opportunities to care for patients and conditions that may be difficult to encounter in traditional clinical placements, including:

- Pediatrics
- Obstetrics
- Mental health settings
- Deteriorating patients
- Emergency situations
- Leadership and delegation scenarios

This standardization helps address variability in clinical exposure while supporting underserved or resource-limited programs.

In addition, therapeutic communication and professionalism are integrated throughout the platform. Learners practice patient and family education, empathy during emotionally challenging conversations, Situation, Background, Assessment, Recommendation (SBAR) communication with providers and charge nurses, and structured escalation of care.

Communication decisions directly impact patient outcomes within the simulation. Failure to appropriately escalate changes in patient condition may result in patient deterioration, reinforcing the importance of communication and patient safety. Establishing psychological safety and equitable access sets the conditions for effective learning, but those conditions depend on how carefully learners and faculty are prepared before the simulation begins.

Prebriefing: preparation and briefing

The HSSOBP identifies prebriefing as an essential component of effective simulation-based education. Two components of prebriefing are preparation and briefing. Preparation occurs before the simulation experience and supports learner readiness, while briefing establishes expectations, orientation, and psychological safety immediately prior to simulation.

Shadow Health Lab with VR incorporates structured orientation and preparation processes designed to reduce cognitive load and optimize learner readiness. Learners start with an in-headset orientation experience that walks them step-by-step through their VR environment, controls, and how to complete certain skills. Next, immediately before the patient care scenario begins, learners receive patient history and contextual information, electronic health record (EHR) data, handoff reports, and guidance regarding workflow expectations. This helps them focus on clinical objectives once the simulation begins rather than on technology-related anxiety.

Faculty are supported with:

- Briefing guides
- Facilitation instructions
- Orientation recommendations
- Scenario objectives mapped to the American Association of Colleges of Nursing (AACN) Essentials

Together, these resources ensure that both learners and faculty arrive at the simulation with shared expectations and clear objectives. The inclusion of nursing handoff reports and EHR exploration mirrors authentic clinical preparation processes and encourages learners to begin thinking clinically before entering the simulation. With learners and faculty oriented and objectives clearly established, the quality of the simulation experience itself depends on what happens next: skilled, adaptive facilitation throughout the patient encounter.

Facilitation

The HSSOBP Facilitation standard emphasizes the importance of competent facilitators who guide learner development before, during, and after simulation experiences. Shadow Health Lab with VR was intentionally designed to preserve and strengthen facilitator involvement rather than replace it.

Surrounding the simulation experiences, facilitators actively:

- Prebrief the students
- Observe learner performance
- Take notes regarding learner actions and behaviors
- Determine scenario progression based upon learners meeting simulation objectives
- Select scenario phases based on learner performance
- Trigger scenario actions and supplemental patient and character responses
- Guide reflective learning during debriefing

Importantly, facilitators maintain learner-centered experiences while preserving learner autonomy. Learners remain responsible for making clinical decisions, prioritizing care, communicating with team members, and responding to changing patient conditions.

Facilitators play a central role in supporting individualized feedback. The facilitator application allows instructors to track learner objectives through observable actions; while some objectives are automatically captured by the system, others, such as therapeutic communication effectiveness, require facilitator judgment and documentation. After the simulation experience, facilitators have access to learner transcripts and action logs that support individualized debriefing and reflective discussion.

Shadow Health Lab with VR also helps address faculty workload and scalability challenges associated with traditional simulation. Minimal physical setup and transition time are required between scenarios, allowing programs to increase simulation opportunities while reducing operational burden. Facilitation during the scenario creates the conditions for learning, but the HSSOBP are clear that much of that learning is only realized afterward through structured debriefing and guided reflection.

Debriefing and reflective learning

The HSSOBP identify debriefing as a critical component of simulation-based learning and reflective practice. Consistent with the broader simulation literature, much of the meaningful learning in simulation-based education occurs during debriefing, as facilitators guide learners toward deeper understanding of their patient care decisions and outcomes.

Shadow Health Lab with VR incorporates structured, facilitator-led debriefing designed to support reflective clinical reasoning, patient safety thinking, and competency development.

Faculty are provided with:

- Structured debriefing guides
- Reflection prompts
- Learner transcripts
- Scenario outcome information

Debriefing may occur individually or within a group depending on faculty preference and learner needs. Facilitators guide learners through reflective questioning focused on clinical judgment and prioritization, communication decisions, missed cues, patient safety considerations, escalation of care, and alternative interventions. Facilitators help learners connect their actions and decisions to patient outcomes while reframing mistakes as opportunities for growth and learning. The debriefing process is intentionally formative rather than punitive. Learners are encouraged to reflect openly on challenges, uncertainties, and decision-making processes within psychologically safe environments.

Repeatability is another important component of reflective learning. Learners may repeat scenarios after debriefing, allowing them to apply feedback, refine clinical judgment, and work toward mastery of learning objectives. These learners will be rewarded by seeing an improvement in their patient's condition by achieving the intended objectives and going down a different patient outcome branch within the scenario. Reflective debriefing gains its full value when it is anchored to observable, measurable competencies, making competency-based design not a separate concern, but the natural extension of the debriefing process.

Competency-based education and standardized learning opportunities

The updated HSSOBP strongly emphasize competency-based education, observable learner behaviors, and measurable outcomes. Shadow Health Lab with VR supports competency-based education by providing standardized, immersive patient care opportunities while allowing individualized learner pathways based on learner decisions and performance. This approach reflects the HSSOBP emphasis on observable learner behaviors and measurable outcomes as the foundation for evaluating simulation effectiveness.

Unlike traditional clinical experiences where learner exposure may vary significantly depending on clinical site, patient census, or preceptor assignment, Shadow Health Lab with VR provides equitable access to consistent learning opportunities. At the same time, learner experiences remain individualized because patient outcomes and scenario progression change based on learner decisions. This combination of standardization and learner-driven variability supports both competency development and authentic clinical reasoning. Delivering on those competency goals requires that the simulation experiences themselves are designed with sufficient realism, intentionality, and fidelity to support authentic clinical reasoning.

Simulation design and realism

The HSSOBP emphasize intentional simulation design grounded in evidence-informed educational practice. Shadow Health Lab with VR scenarios were developed through collaboration among practicing clinicians, nurse educators, learning and simulation designers, and subject matter experts.

Realism and fidelity were prioritized throughout development and refinement. Scenario design intentionally incorporates:

- Realistic patient communication
- Dynamic patient conditions
- Authentic patient reactions to interventions
- Environmental distractions
- Family interactions
- Realistic workflows and escalation processes

Patient states change based on learner decisions and interventions. Patients may stabilize or deteriorate depending on learner communication and actions, reinforcing realistic cause-and-effect relationships within patient care.

The platform supports clinical judgment development through realistic patient responses and evolving patient conditions. Learners must recognize cues, identify changes in patient status, determine appropriate interventions, escalate care when necessary, and evaluate patient responses to interventions.

Examples of clinical judgment development include:

- Identifying incorrect IV fluid rates
- Escalating care as needed
- Prioritizing care for multiple acute patients in leadership scenarios
- Communicating with family members
- Managing emotionally complex patient situations

Each scenario underwent multiple rounds of testing and refinement with nursing faculty, students, and subject matter experts. Realism is balanced with psychological safety through facilitator oversight, structured debriefing, and guided learning, ensuring that fidelity serves the educational purpose rather than increasing learner distress.

Implications for nursing education

The challenges facing nursing education including clinical placement shortages, faculty workload, inconsistent learner exposure, and rising competency expectations, are not new, but they are intensifying. Shadow Health Lab with VR addresses several of these pressures simultaneously, making it a particularly practical addition to programs seeking to expand simulation capacity without proportionally increasing operational demand.

The most immediate implication is for learner participation. In traditional simulation, role rotation means that in any given scenario, only one or two students occupy the active nursing role at a time. Shadow Health Lab with VR places every learner in that role independently, increasing the volume of deliberate practice each student receives across a course or program. For programs with large cohorts or limited simulation lab hours, this shift in participation structure can meaningfully increase exposure to clinical judgment opportunities without requiring additional physical space or equipment.

For faculty and simulation coordinators, the reduced setup burden between scenarios has practical value. Transitioning between patient cases requires minimal physical preparation, allowing programs to run more scenarios within the same time window and to respond more flexibly to learners progressing at different rates. This does not diminish the facilitator's role of preparation, active observation, and debriefing, but it reduces the logistical overhead that often limits simulation frequency.

The platform also has implications for curriculum equity. Students across different clinical sites or program tracks may encounter widely varying patient populations in traditional placements. Shadow Health Lab with VR provides consistent access to experiences that are clinically important but often difficult to guarantee, including pediatric, obstetric, mental health, and deteriorating patient scenarios, helping programs ensure that competency exposure does not vary by placement luck.

Programs may implement Shadow Health Lab with VR across a range of contexts, including simulation laboratories, clinical replacement experiences, remediation or makeup simulations, and classroom-based active learning. Each context carries different facilitation considerations, and the HSSOBP emphasis on competent facilitation applies across all of them. The platform is not designed for fully independent learner use; faculty involvement in prebriefing, scenario progression, and debriefing remains a non-negotiable component of its educational value.

Taken together, these implications suggest that Shadow Health Lab with VR is best understood not as a standalone solution, but as a flexible, evidence-aligned tool that strengthens simulation programs when integrated thoughtfully alongside existing modalities like traditional simulation, skills lab, and clinical placement, rather than in place of them.

Future directions

As VR simulation becomes more prevalent in nursing education, the field is well-positioned to move beyond feasibility and adoption questions toward more rigorous investigation of outcomes. Shadow Health Lab with VR offers a structured, consistent platform that lends itself to this kind of research. The scenarios are standardized, facilitator tools generate observable data, and the learner pathways are tracked making it a practical environment for studying what immersive simulation actually produces.

The most pressing research questions center on learning transfer. Whether gains in clinical judgment, communication, and prioritization observed within the simulation environment carry forward into clinical practice remains an open and important question. Longitudinal studies following learners from simulation through clinical placement and into early practice would help establish the extent and durability of that transfer, and would strengthen the evidentiary basis for VR simulation as a component of competency-based curricula.

Within the platform itself, several dimensions of learner development warrant closer study. How does confidence and clinical readiness change across repeated scenario exposure? Do learners who engage with Shadow Health Lab with VR earlier in their programs show different competency trajectories than those introduced to it later? How do different debriefing approaches affect the depth of reflective learning? These questions are answerable through structured implementation and data collection, and nursing programs adopting the platform are well-placed to contribute to this evidence base.

Facilitator experience is another underexplored area. The HSSOBP are unambiguous that facilitation quality is central to simulation outcomes, yet relatively little research addresses how faculty adapt to VR-specific facilitation demands, what support structures reduce the learning curve, and how workload compares to traditional simulation over time. Understanding the facilitator experience is not peripheral to the research agenda; it is essential to sustainable implementation.

Finally, as the platform expands its scenario library, opportunities will grow to study competency progression across increasingly complex patient encounters, delegation and leadership development, and the effects of scenario sequencing on clinical reasoning. These directions are not speculative, they follow directly from the platform's design and the HSSOBP's emphasis on measurable, observable outcomes as the foundation of simulation effectiveness.

Conclusion

Nursing education is navigating a convergence of pressures including shrinking clinical placement availability, rising competency expectations, uneven learner exposure, and the operational demands of traditional simulation. Meeting these challenges requires approaches that are both scalable and educationally rigorous.

Shadow Health Lab with Virtual Reality offers one such approach. By placing every learner in an active nursing role within immersive, facilitator-guided patient scenarios, the platform addresses access and participation gaps without sacrificing the deliberate practice, reflective learning, and facilitator involvement that the Healthcare Simulation Standards of Best Practice identify as foundational. The alignment documented throughout this paper is not incidental; it reflects the intentional design choices embedded in the platform's development, from competency-mapped scenario progression to structured debriefing tools and psychologically safe learning environments.

Importantly, Shadow Health Lab with VR does not position itself as a replacement for traditional simulation or clinical experience. Rather, it functions as a complement: a consistent, lower-overhead option for building and assessing clinical judgment that programs can integrate alongside existing modalities. This flexibility makes it particularly valuable for programs operating under resource constraints or seeking to standardize learner opportunities across sites.

As VR simulation matures as a modality, the questions that follow are practical ones: How does immersive VR experience translate to clinical performance? How does it develop over repeated use? What facilitation approaches yield the strongest outcomes? These are not hypothetical; they are answerable through the kind of intentional, evidence-informed implementation that the HSSOBP framework was designed to support. Shadow Health Lab with VR is built to be part of that ongoing inquiry.

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