

UNIT-BASED (IN-SITU) SIMULATION MANUAL

First Edition



Purpose of this Manual

To provide a framework for the development and implementation of a simulation program within the clinical environment. This guide provides a set of best practices upon which to build your Unit-based program in collaboration with NYC Health + Hospitals Simulation Center.

NYC
HEALTH+
HOSPITALS

SIMULATION
CENTER



FUNDAMENTALS OF SIMULATION

- Definitions 1
- Potential Applications of Unit-based Simulation..... 5

ELEMENTS OF SIMULATION

- Element 1: Secure Interprofessional Leadership Buy-In and Assemble Core Team 6
- Element 2: Perform a Needs Assessment to Identify the Problem or Gap 7
- Element 3: Planning and Rollout..... 10
- Element 4: Key Processes of Curriculum Design 13
- Element 5: Evaluation and Sustainability..... 14

RESOURCES

- Unit-based Simulation Checklist 15
- Simulation Activity Tracker 16
- Example Simulation Announcement... 18
- Whiteboard Schematic 20
- References..... 20
- Simulation Center Resource Team..... 21

DEFINITIONS

Debrief (Debriefing) \ dē'brēf \ *noun (verb)*
Etym. debrief "obtain information (from someone) at the end of a mission," 1945, from de- + brief (*verb*).
 Related: Debriefed; debriefing.

Definition

- (*noun*) A formal, collaborative, reflective process within the simulation learning activity.
- An activity that follows a simulation experience and led by a facilitator.
- (*verb*) To conduct a session after a simulation event where educators/instructors/facilitators and learners re-examine the simulation experience for the purpose of moving toward assimilation and accommodation of learning to future situations (Johnson-Russell & Bailey, 2010; NLN-SIRC, 2013); debriefing should foster the development of clinical judgment and critical thinking skills (Johnson-Russell & Bailey, 2010).
- To encourage participants’ reflective thinking and provide feedback about their performance while various aspects of the completed simulation are discussed.
- To explore with participants their emotions and to question, reflect, and provide feedback to one another (i.e., guided reflection).

Compare: FEEDBACK, GUIDED REFLECTION, ADVOCACY, INQUIRY.

Fiction Contract \ 'fik-shən\ 'kän-,trakt \ (*noun*)
Etym. fiction (*noun*) something that is not true; something invented by the imagination or feigned; an assumption of a possibility as a fact irrespective of the question of its truth; a useful illusion or pretense; the action of feigning or of creating with the imagination. **Etym. contract** (*noun*) a binding agreement between two or more persons or parties.

Definition

- A concept which implies that an engagement in simulation is a contract between the instructor and

The Basic Assumption: Everyone participating in the simulation is intelligent, capable, and wants to learn new things.

Think about the whole healthcare team to create interprofessional scenarios.

Developing a sustainable, effective program takes time.

the learner: each has to do his or her part to make the simulation worthwhile (Rudolph, Dieckmann, et al.).

- The degree of engagement that healthcare trainees are willing to give the simulated event; also known as the “suspension of disbelief,” it is a literary and theatrical concept that encourages participants to put aside their disbelief and accept the simulated exercise as being real for the duration of the scenario.

Fidelity \ fə-’de-lə-tē \ (noun)

Etym. fidelity early 15c., “faithfulness, devotion,” from Middle French *fidélité* (15c.), from Latin *fidelitatem* (nominative *fidelitas*) “faithfulness, adherence, trustiness,” from *fidelis* “faithful, true, trusty, sincere,” from *fides* “faith.” From 1530s as “faithful adherence to truth or reality;” specifically of sound reproduction from 1878.

Definition

- The degree to which the simulation replicates the real event and/or workplace; this includes physical, psychological, and environmental elements.
- The ability of the simulation to reproduce the reactions, interactions, and responses of the real world counterpart. It is not constrained to a certain type of simulation modality, and higher levels of fidelity are not required for a simulation to be successful.
- The level of realism associated with a particular simulation activity; fidelity can involve a variety of dimensions, including (a) physical factors such as environment, equipment, and related tools; (b) psychological factors such as emotions, beliefs, and self-awareness of participants; (c) social factors such as participant and instructor motivation and goals; (d) culture of the group; and (e) degree of openness and trust, as well as participants’ modes of thinking (INACSL, 2013).

See also: ENVIRONMENTAL FIDELITY, HIGH FIDELITY, LOW FIDELITY, PSYCHOLOGICAL FIDELITY, REALISM, SIMULATION FIDELITY. FUNCTIONAL FIDELITY

In Situ/In Situ Simulation \ in - sĭtju \ sim-yuh-ley-shuh n (noun \ adjective)

Etym. in situ 1740, Latin, literally “in its (original) place or position,” from ablative of *situs* “site.”

Etym. simulation noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- Taking place in the actual patient care setting/ environment in an effort to achieve a high level of fidelity and realism; this training is particularly suitable for difficult work environments due to space constraints or noise. Examples: ambulance, small aircraft, dentist’s chair, catheterization lab (Kyle & Murray, 2008). This training is valuable to assess, troubleshoot, or develop new system processes.

Psychological Safety \ sahy-kuh-loj-i-kuh \ seyf-tee (noun)

Etym. psychology (noun) 1650s, “study of the soul,” from Modern Latin *psychologia*, probably coined mid-16c. in Germany by Melanchthon from Latinized form of Greek *psykhe* - “breath, spirit, soul” + *logia* “study of.” Meaning “study of the mind” first recorded 1748, from Christian Wolff’s “*Psychologia empirica*” (1732); main modern behavioral sense is from early 1890s. **Etym. safety** (noun) early 14c., from Old French *sauvete* “safety, safeguard; salvation; security, surety,” earlier *salvetet* (11c., Modern French *sauveté*), from Medieval Latin *salvitatem* (nominative *salvitas*) “safety,” from Latin *salvus*.

Definition

- A feeling (explicit or implicit) within a simulation-based activity that participants are comfortable participating, speaking up, sharing thoughts, and asking for help as needed without concern for retribution or embarrassment.
- The perception of members of the team that the team is safe for risk taking, and mistakes will be considered learning opportunities rather than there being embarrassment or punitive consequences (Edmondson, 1999; Higgins et al., 2012).

See also: SIMULATION LEARNING ENVIRONMENT

Treat participants as peers, respect and honor opinions.

Create an environment in which abilities are acknowledged and respected.

Simulated Patient (SP) \ sim-yuh-leyt-id \ pey-shuh nt
(*noun*)

[Note: This term is often synonymous with Standardized Patient]

Etym. simulated (*adjective*) 1620s, “feigned,” past participle adjective from simulate (*verb*). Meaning “imitative for purposes of experiment or training” is from 1966; commercial jargon, “artificial, imitation” by 1942. **Etym. patient** (*noun*) “suffering or sick person under medical treatment,” late 14c., from Old French *pacient* (*noun*), from the adjective, from Latin *patienten*.

Definition

- A person who has been carefully coached to simulate an actual patient so accurately that the simulation cannot be detected by a skilled clinician. In performing the simulation, the SP presents the gestalt of the patient being simulated; not just the history, but the body language, the physical findings, and the emotional and personality characteristics as well (Barrows 1987). Often used interchangeably with standardized patients in the USA and Canada, but in other countries simulated patient is considered a broader term than standardized patient because the simulated patient scenario can be designed to vary the SP role in order to meet the needs of the learner.
- An individual who is trained to portray a real patient in order to simulate a set of symptoms or problems used for healthcare education, evaluation, and research (SSH).

SPs can be used for teaching and assessment of learners including but not limited to history/consultation, physical examination, and other clinical skills in simulated clinical environments (ASPE).

SPs can also be used to give feedback and evaluate learner performance (ASPE).

See also: SIMULATED PERSON, STANDARDIZED PATIENT, STANDARDIZED/SIMULATED PARTICIPANT, ACTOR, EMBEDDED PARTICIPANT, ROLE PLAYER, CONFEDERATE.

Faculty members learn as much from participants as participants learn from them.

Simulation \ sim-yuh-ley-shuh n \ (*noun*)

Etym. simulation (*noun*) noun of action from past participle stem of *simulare* “imitate,” from stem of *similis* “like.” Meaning “a model or mock-up for purposes of experiment or training” is from 1954.

Definition

- A technique that creates a situation or environment to allow persons to experience a representation of a real event for the purpose of practice, learning, evaluation, testing, or to gain understanding of systems or human actions.
- An educational technique that replaces or amplifies real experiences with guided experiences that evoke or replicate substantial aspects of the real world in a fully interactive manner (Gaba Future Vision Qual Saf Health Care 2004).
- A pedagogy using one or more typologies to promote, improve, or validate a participant’s progression from novice to expert (INACSL, 2013).
- The application of a simulator to training and/or assessment (SSH).
- A method for implementing a model over time.

POTENTIAL APPLICATIONS OF UNIT-BASED SIMULATION

- + Examine work flow
- + Improve culture
- + Practice teamwork and communication
- + Orient staff to new policies and procedures
- + Assess the efficacy of a system and identify gaps
- + Practice rare events

ELEMENT 1: SECURE INTERPROFESSIONAL LEADERSHIP BUY-IN AND ASSEMBLE CORE TEAM

Interprofessional leadership buy-in requires a true commitment to the program, including:

- + Ability to provide core team and participants with protected time
- + Willingness to provide budget and space
- + Ability to meet regularly for guidance and updates

Secure buy-in from:

- + Medical and Nursing Leadership
- + Allied Health Leadership
- + Risk Management and Patient Safety

Depending upon the nature of your intervention, leadership buy-in may be required from the following:

- + Hospital Police
- + Executive Administration/Administrative Clerks
- + Blood Bank
- + Environmental Services
- + Materials Management
- + Laboratory
- + Admitting
- + Information Technology
- + Others

Assemble Core Team

- + Leader – **must be one person** who is the ultimate owner, has a detailed understanding of all aspects of the project, and has the authority to act.

- + The team must have **at least one person** from each domain:

Educational Personnel

- Design, deliver, and debrief scenarios.

Technical Personnel

- Manage local IT, audio-visual and simulation equipment issues. This person will be responsible to set-up and run simulation equipment during scenarios.

Administrative Personnel

- Coordinate scheduling of participants, instructors
- Coordinate registration and sign-in sheets or iPad sign-in
- Handle CME/CNE requirements (if applicable);
- Manage tracking of evaluations/metrics and submit to the NYC Health + Hospitals Simulation Center hub quarterly or as requested

ELEMENT 2: PERFORM A NEEDS ASSESSMENT TO IDENTIFY THE PROBLEM OR GAP

- A. Perform Needs Assessment
- B. Develop Clear Goals and Objectives
- C. Identify Potential Resources
- D. Develop Metrics
- E. Develop Operational Plan for Sustainability

Element 2A. Perform Needs Assessment

- + The clearer the definition of your problem, the better.
- + What is the current approach (who is doing what, when, how, resource limitations)?
- + What is the ideal approach?
- + Who will do what and how much/How well and by what time (when)?

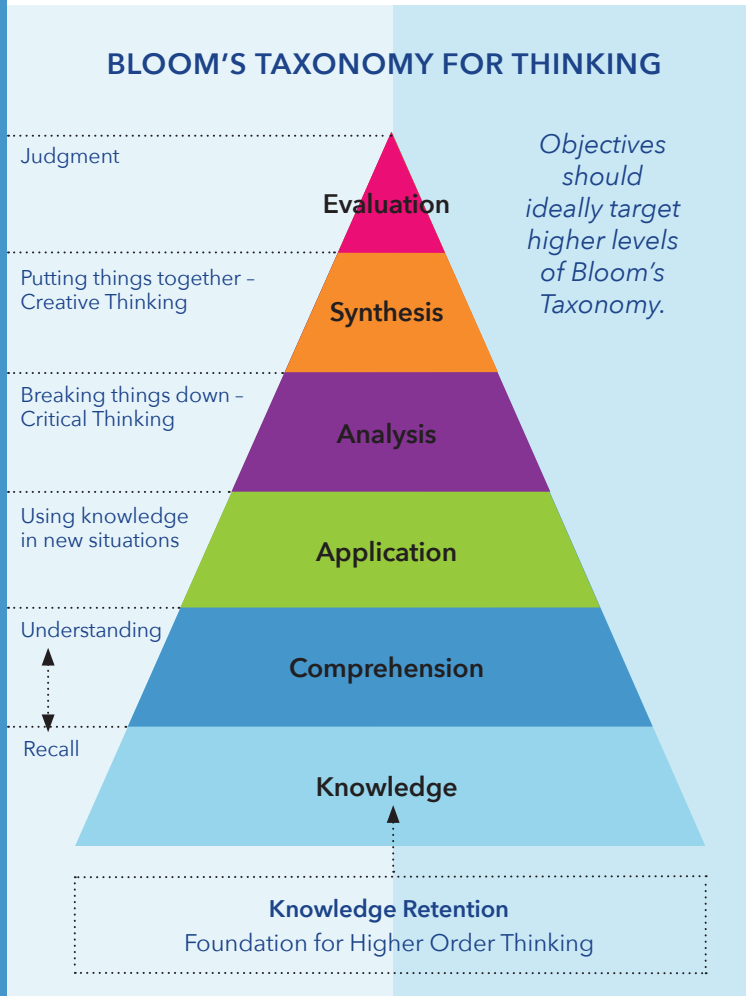
Participants and facilitators work together to optimize learning.

Foster intellectual freedom and encourage experimentation.

Element 2B. Develop Clear Goals and Objectives

- + Review types and levels of objectives—is the intervention targeted at the participant level, process level, or is it outcome-based?
- + Make sure there is one measurable verb in each objective and strive to keep all your learning objectives measurable, clear and concise; limit to 2-3 that are high priority and achievable.

Keep learning self-directed. Participants take responsibility to learn.



See also Reference i: "Bloom's Taxonomy of Cognitive Learning Objectives."

Element 2C. Identify Potential Resources

- + Actual Cases
- + Conversations with NYC Health + Hospitals Central Office Staff
- + Risk Management/Patient Safety data
- + Existing NYC Health + Hospitals Policies/Protocols
- + Publications/educational resources from professional societies
- + The Joint Commission
- + Feedback from participant surveys from other educational activities
- + People already doing simulation – NYC Health + Hospitals Simulation

Element 2D. Develop Metrics

- + Utilizing the stated goals and objectives as a guide, identify metrics that will capture whether the intervention has met its purpose.
- + Possible metrics
 - Patient Safety (AHRQ Survey)
 - Patient satisfaction (Press-Ganey and HCAHPS scores)
 - Staff satisfaction
 - Process outcomes (i.e., time to hang antibiotics, time to transfer)
 - Clinical outcomes

Element 2E: Develop Operational Plan for Sustainability

- + The operational plan should include short-term initial start-up costs (i.e., space, equipment, and personnel) and long-term goals (i.e., allocation of FTE, CME/CNE credits, equipment maintenance, warranties, and consumables).

Create regular feedback mechanisms for participants to tell faculty what works best for them.

ELEMENT 3: PLANNING AND ROLLOUT

Work Plan

- + Create a work plan with timeline of tasks and key milestones.
- + Expect 2-10 months of planning.
 - Timeline will depend upon degree of leadership buy-in and sense of urgency, local simulation/educational expertise.
- + Hold regular meetings (e.g. weekly) with core faculty.

Identify Participants and Block Out Schedules

- + As schedules are often made 2-3 months in advance, consider blocking out time well ahead of schedule creation.
- + The majority of staff in the unit should complete a NYC Health + Hospitals Simulation center-based simulation prior to participation in unit-based simulations.

This gives the participants a frame of reference and exposure to simulation prior to intervention.

Procure Equipment and Space


- + Identify space in unit for simulation drills and debriefing on the floor.
- + Purchase equipment that is related to learning objectives.
- + Identify secure storage space for equipment.
- + Arrange transportation of equipment as required.
- + Consider environmental fidelity of simulation environment including setup and breakdown.

Create an environment where individual needs and uniqueness are honored.

Develop “No-Go”Criteria

- + Criteria agreed upon by all stakeholders whereby a simulation session will be cancelled if any of the conditions are met.

At least one-quarter of simulation sessions will likely be cancelled due to “No-Go” circumstances. No-Go criteria will be unique to each unit. Below is an example from an NYC Health + Hospitals Obstetric/NICU Unit-based Program.

 NO SIMULATION IF...
A Cesarean delivery is in progress
A Cesarean delivery is in progress in the Main OR
An epidural being placed
Active OB STAT
Active RRT
L&D floor on diversion
≥50% of the NICU staff has a patient ratio of 3:1
1 hour after admission of a critical NICU patient (i.e., patient requires lines, intubation, anomaly)
Transporting patient to or from another facility (maternal or fetal)
There are <8 RNs on L&D
On the same day a serious event has occurred in the department

Faculty listen to participants and make changes based on their input.

Create an environment in which participants feel safe and supported.

Your Pre-Rollout Checklist

- + Visit unit to identify space for simulation drills and debriefing on the floor.
- + Consider basic needs including bathroom, room temperature, food, etc.
- + Secure simulation space and debriefing space.
- + Purchase equipment suited to the space identified.
- + Identify storage space for equipment.
- + Arrange transportation of equipment.
- + Coordinate room setup and breakdown.

Fidelity and Technology

- + High-technology simulators (i.e., full-body manikins, virtual reality equipment) have a lot of functionality but, depending on the goals and objectives of the program, may not be required.
- + Think outside the box: At times, low-technology/homemade equipment can meet the objective better than a high-technology simulator/equipment.
- + Recruit/train standardized/simulated patients as needed.

NYC Health + Hospitals Simulation Center Policy on Medications & Devices used in Unit-based Simulation

Under NO circumstances should simulated medications or devices be utilized in the clinical environment. There have been serious patient harms when these simulated materials have been administered to a REAL patient!



www.usatoday.com/story/news/nation/2015/01/14/unsterile-fluid-recall/21782015/

See also Reference iii, "Ignaz Semmelweis Redux?" for more about safety challenges of unit-based simulation and strategies to address them.

Advertising Roll-out Program

- + Talk about the program in a multi-disciplinary fashion from the start. Introduce the program, its objectives, and what to expect via:
 - Email
 - Posted flyers
 - Business meetings
 - Grand Rounds

See also Resources 2 and 3: Simulation Activity Tracker and Example Simulation Announcement.

ELEMENT 4: KEY PROCESSES OF CURRICULUM DESIGN

- A. Build a "Safe Container"
- B. Know the Fundamentals of Simulation Education

Element 4A: Build a "Safe Container"

- + What is a "Safe Container"?

It's a psychologically safe context for learning.

A team with a culture of psychological safety encourages open discussion of tough issues.

It not only tolerates disagreement, it nurtures contrasting points of view. Leaders can help develop and foster this type of environment.

See also References iv, v & vii: "There's No Such Thing as 'Nonjudgmental' Debriefing," "Establishing a Safe Container for Learning in Simulation," and "Creating Psychological Safety in Our Workplaces."

Challenge just beyond present level of ability.

Participants grow more through active involvement in learning.

Element 4B: Know the Fundamentals of Simulation Education

- + Simulation bridges classroom learning and real life experience (Society for Simulation in Healthcare).
- + Adult education—learning moves from dependency toward increasing self-directedness.
- + Adults draw from their reservoir of experience and come ready to learn because it has applicability (almost immediate) to their lives.
- + Adults feel that the learning is a process of developing increased competence to achieve their full potential.

See also Reference viii: *“Seven Characteristics of Highly Effective Adult Learning Programs.”*

ELEMENT 5: EVALUATION AND SUSTAINABILITY

Participants want to know what were the fruits of the simulations, what’s happening next. Closing the loop and providing updates are essential to program sustainability.

Resource 4 (page 20) is a schematic of a whiteboard that provides a unit with details regarding simulation activity, the lessons learned during debriefings, and the status of areas of improvement identified.

Placed in a staff area, a whiteboard such as this (which should be tailored to each individual unit) helps drive culture change and closes the loop with participants.

- + Short term evaluations
 - Simulation evaluation
 - Instructor evaluation
- + Long term
 - Metrics as defined during needs assessment

Pre-Simulation	
Review No-Go criteria with appropriate interprofessional staff to confirm that it is safe to proceed with the simulation	<input type="checkbox"/>
Prepare simulation environment and debriefing space	<input type="checkbox"/>
Prepare simulator/simulated patient for the activity	<input type="checkbox"/>
Ensure that there are no simulated medications/ devices and that clinical resources are not jeopardized	<input type="checkbox"/>
Notify others that “Simulation is in Progress” by posting sign in the area	<input type="checkbox"/>
Electronically register participants if available, otherwise use paper registration sheet and complete participant agreement	<input type="checkbox"/>
Pre-Simulation Briefing	
Highlight Goals/Objectives of the Simulation Encounter	<input type="checkbox"/>
Review The Basic Assumption, Las Vegas Rule, and Fiction Contract	<input type="checkbox"/>
Familiarize participants with the “Patient” and environment	<input type="checkbox"/>
Post-Simulation Debriefing	
Preview: Provide Preview including how long the debriefing will last	<input type="checkbox"/>
Reactions Phase: How are you feeling? & What are the facts?	<input type="checkbox"/>
Understanding Phase: Using the +/- Δ as well as Advocacy-Inquiry	<input type="checkbox"/>
Summary Phase: Take Home Messages	<input type="checkbox"/>
Evaluation	
Participants may complete an evaluation of the activity and any CME paperwork (if appropriate)	<input type="checkbox"/>
Record the activity, including lessons learned, in the Simulation Activity Tracker	<input type="checkbox"/>

Date of Activity	Facilitator	Simulation or Clinical Event?	Description of Case	Debriefing Points (bullet format)	Latent Errors Identified				Teamwork/Leadership
					Medication	Equipment	Resources	Other	

RESOURCE 3: EXAMPLE SIMULATION ANNOUNCEMENT

Dear Jacobi Team,

We are excited to announce the start of the JMC Obstetrics unit-based Simulation Program. This is one of the first interventions of its kind in the NYC Health + Hospitals system and will serve as a model to others across the corporation. This initiative will mesh a number of NYC Health + Hospitals provided programs that you are already familiar with like TeamSTEPPS, Communication Training, Communication Competency Training, Just Culture, Lean (Break Through) and Green training (A3).

Why?

Although there have been many great initiatives launched by Patient Safety and Simulation experts, the overall picture of error in healthcare has not improved. It is now the belief of many experts that the only way to manifest real change is to embed practices such as teamwork, simulation and debriefing into everyday patient care at the unit level. Our plan is to start simulation drills on Labor and Delivery beginning the 2nd week of August. The drills will be conducted twice a week at 11:00am and 10:30pm.

What will happen?

During your regular shift (including nights and weekends), short simulations spanning various maternal and neonatal emergencies will be conducted on the Labor and Delivery and Postpartum Units. The simulations will be followed by a structured debriefing.

Where do we want to be and how will we know when we've arrived?

We will be measuring improvement in three separate domains. These include: staff satisfaction, teamwork, and selected clinical indicators. In six months, the intervention will be reviewed to determine what are the advantages and disadvantages of this new approach. The aim of this program is not to evaluate individual performance.

Our goal is to use unit-based simulation to improve teamwork, coordination, patient outcomes, and safety on the Labor and Delivery Unit. We understand that there are some situations in which a scheduled simulation should be cancelled. Below, you will find the "No-Go" criteria for simulations. As you know, emergencies can happen at any time and it is best to be prepared for any and all situations!

Please feel free to contact your supervisors or any members of the JMC Obstetrics In-Situ Program Team at any time for further information.

Thank you for your active participation!

NO SIMULATION IF...
A Cesarean delivery is in progress
A Cesarean delivery is in progress in the Main OR
An epidural being placed
Active OB STAT
Active RRT
L&D floor on diversion
≥50% of the NICU staff has a patient ratio of 3:1
1 hour after admission of a critical NICU patient (i.e. patient requires lines, intubation, anomaly)
Transporting patient to or from another facility (maternal or fetal)
There are <8 RNs on L&D
On the same day a serious event has occurred in the department

RESOURCE 4: WHITEBOARD SCHEMATIC

Statistics/Simulation Recap		Doodles/Inspirational Quotes "If you want to go fast, go alone. If you want to go far, go together." unknown	
Areas of Improvement Identified During Debriefing and Status of Improvement	Unit Celebrations - Shining Stars	Announcements	
		Comments	

REFERENCES

- i. Adams, NE. Bloom's Taxonomy of Cognitive Learning Objectives. *Journal of the Medical Library Association: JMLA*. 2015;103(3):152-153.
- ii. Knowles, MS. Application in Continuing Education for the Health Professions: Chapter 5 of "Andragogy in Action." *Mobius*. 1985;5(2):80-100.
- iii. Raemer, DB. Ignaz Semmelweis Redux? *Simulation in Healthcare: Journal of the Society for Simulation in Healthcare*. 2014;9(3):153-155.
- iv. Rudolph, JW, Simon, R, Dufresne, RL, and Raemer, DB. There's No Such Thing as "Nonjudgmental" Debriefing: A Theory and Method for Debriefing with Good Judgment. *Simulation in Healthcare: Journal of the Society for Simulation in Healthcare*. 2006;1(1):49-55.
- v. Rudolph, JW, Raemer, DB and Simon, R. Establishing a Safe Container for Learning in Simulation: The Role of the Presimulation Briefing. *Simulation in Healthcare: Journal of the Society for Simulation in Healthcare*. 2014;9(6):339-349.

- vi. Salas, E, Tannenbaum, SI, Kraiger, K, and Smith-Jentsch, KA. The Science of Training and Development in Organizations: What Matters in Practice. *Psychological Science in the Public Interest: A Journal of the American Psychological Society*. 2012;13(2):74-101.
- vii. Sherman, R. (2012) Creating Psychological Safety in Our Workplaces.
- viii. Billington, Dorothy D. Seven Characteristics of Highly Effective Adult Learning Programs. <http://education.jhu.edu/PD/newhorizons/lifelonglearning/workplace/articles/characteristics/>

SIMULATION CENTER RESOURCE TEAM

- Director** Katie Walker, MB, RN
- Clinical Director** Komal Bajaj, MD, FACOG, FACMG
- Clinical Director** Michael Meguerdichian, MPH, MD
- Director of Operations** Jessica Pohlman, MPA, NREMT-P
- Senior Simulation Specialist** Juan Cruz, MICP
- Simulation Specialist** Steve Lichtenberg, NRP
- Coordinating Manager** Kimberley Miller
- Simulation Coordinator** Tatiana Malvoisin

Simulation Center Scope of Service includes but is not limited to:

- + Simulation Education & Training
- + Scenario Development
- + Faculty Development
- + Fellowship Program
- + Equipment Loan

Simulation Center Website

www.nychealthandhospitals.org/simulationcenter

The Simulation Center Hub

1400 Pelham Parkway South

Building 4, 2nd Floor, Room 200

Bronx, NY 10461

(718) 975-6500

www.nychealthandhospitals.org/simulationcenter

