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MCH Innovations Database Practice Summary & Implementation Guidance

On-Demand Telesimulation in Maternal-Newborn Care and Clinical Lactation

Go beyond boring webinars! On-Demand Telesimulation is the first and only online program for live, clinical practice with pregnant or lactating patients and their newborns. Healthcare professionals who complete telesimulations receive oral and written feedback on their clinical performance relevant to lactation support and maternal-newborn care.



Location

Michigan



Topic Area

Telehealth/Emergency Preparedness



Setting

Clinical



Population Focus

Women/Maternal Health



NPM

NPM 1: Well-Woman Visit, NPM 2: Low-Risk Cesarean Delivery, NPM 3: Risk-Appropriate Perinatal Care, NPM 4: Breastfeeding, NPM 5: Safe Sleep



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Section 1: Practice Summary

PRACTICE DESCRIPTION

The mission of LiquidGoldConcept, Inc. is to ensure all pregnant and lactating women and their children receive timely and skilled support from their healthcare team. LiquidGoldConcept's active learning approach to education will improve health workers' mastery of lactation skills, increasing breastfeeding initiation rates by 43% and decreasing early cessation by 21%, eliminating \$1B annually in United States' healthcare costs.

Problem to be solved. Only 24.9% of parents in the United States reach the recommended six-month exclusive breastfeeding goal. Suboptimal breastfeeding in the United States is associated with over 3,340 annual premature maternal and child deaths and \$18B in healthcare costs. Physicians and nurses receive inadequate training in clinical lactation largely because existing breastfeeding education methods are ineffective. Hospitals and nursing schools currently use low-fidelity sock puppets, their own hands, cloth dolls, or baby doll toys for breastfeeding education; teaching with these products does not lead to significant improvements in learning or patient outcomes. Likewise, lactation educators often lack the time, expertise, or resources to develop a comprehensive curriculum in maternal-newborn care and clinical lactation. Inadequate training of healthcare professionals in clinical lactation is a primary reason for early breastfeeding cessation.

Solution. LiquidGoldConcept has created a turnkey solution (On-Demand Telesimulation) for healthcare professional education in maternal-newborn care and clinical lactation. On-Demand Telesimulation consists of live clinical practice over a video call with pregnant and lactating patients and their newborns. The patients are actor-educators who have been trained by LiquidGoldConcept to portray pregnant and lactating people with various clinical conditions, from perinatal mood disorder to infectious mastitis. The actor-educators utilize realistic breastfeeding and newborn simulators developed and manufactured by LiquidGoldConcept. Simulation is the ideal learning modality for breastfeeding education because lactation support requires repetitive practice and confidence in touching and examining breast tissue and positioning and attaching newborns at the breast. High-fidelity simulation with a standardized patient is the gold-standard for clinical skills acquisition in nursing and medical education. Telesimulation is different from virtual simulation, which is the use of a computer-generated avatar and a pre-programmed chat bot. In a LiquidGoldConcept telesimulation, the clinical encounter is with a live pregnant or lactating patient and their newborn. When directly compared to a virtual avatar patient, interactions with a live actor-educator lead to significantly greater improvements in learning and clinical decision-making. Learners prepare for LiquidGoldConcept telesimulations by completing multiple-choice questions (**Figure 1**). The learners then log into the LiquidGoldConcept-developed scheduling portal to book an appointment with the actor-educator for a specific case scenario. LiquidGoldConcept has 11 case scenarios (*see below*) relevant to topics ranging from neonatal jaundice to maternal mental health played by a cast of dozens of actor-educators (>50% Black/People of Color) living across the United States. Actor-educators are trained by LiquidGoldConcept's team of nurses, physicians, lactation specialists, and



experienced actors to portray different patients with diverse clinical problems relevant to pregnancy, postpartum, and lactation.

Case Scenarios available through the On-Demand Telesimulation Program:

- **Clinical Lactation**
 - [Breast engorgement in the setting of delayed onset of lactogenesis II](#)
 - [Effective breast pump use and management of breast pump-induced trauma](#)
 - [Quality improvement in the hospital through breastfeeding education and support](#)
 - [Sudden-onset breast pain after the newborn sleeps through the night](#)
 - [First time parent wants to learn how to breastfeed their baby without pain](#)
- **Maternal Health**
 - [Bloody nipple discharge in a lactating patient](#)
 - [Breast milk production and maternal mental health](#)
 - [Providing anticipatory guidance and supporting inclusive breastfeeding after breast surgery](#)
 - [Providing anticipatory breastfeeding guidance for a pregnant woman with a rapidly enlarging growth on her nipple](#)
 - [Exclusively pumping patient with pain during sexual intercourse is ready to wean](#)
 - [Low milk production despite trying everything with a worsening nipple rash](#)
- **Newborn Health**
 - [First time parent wants to learn how to breastfeed their baby without pain](#)
 - New case scenarios to be released in early Summer 2021

During a LiquidGoldConcept telesimulation, the actor-educator utilizes realistic and functional simulators, developed and manufactured by LiquidGoldConcept, including a wearable breastfeeding simulator (*Lactation Simulation Model, Figure 2*), a kit of individual silicone breast models (Breast Health Training Tool), and a realistic baby doll (Newborn Oral Assessment and Latch Simulator, patent pending). LiquidGoldConcept products are the only expert-validated simulators for breastfeeding and breast health education that are realistic in look, feel, and functionality and proven to improve learning outcomes. Health professional learners obtain the patient's history, perform a breast or newborn exam, and communicate a management plan to the patient. Actor-educators provide tailored, immediate feedback to each learner on their communication, interpersonal, and clinical skills using a validated rubric (*Figure 1*). Following the telesimulation, learners complete a chart note summarizing the patient encounter, which allows them to reflect on their performance and cement knowledge and skills gains. A clinician grades the chart note using a validated rubric and provides written feedback to each learner on their clinical knowledge and documentation skills. The On-Demand Telesimulation experience has been proven to increase learners' clinical competence in maternal-child care.



CORE COMPONENTS & PRACTICE ACTIVITIES

The goal of On-Demand Telesimulation is to increase a healthcare professional’s clinical competence in maternal-newborn care and clinical lactation, translating to an increase in timely and skilled lactation support and an improvement in maternal-newborn health outcomes.

- Clinical competence in interpersonal, communication, and clinical skills and knowledge relevant to maternal-newborn health and clinical lactation
- Clinical competence in documentation and clinical-decision making skills relevant to maternal-newborn health and clinical lactation
- Healthcare professionals’ translation of clinical skills to maternal-newborn care
- Active engagement in an online learning environment
- Interprofessional and/or team-based learning and behaviors

Core Components & Practice Activities		
Core Component	Activities	Operational Details
Clinical competence in interpersonal, communication, and clinical skills and knowledge relevant to maternal-newborn health and clinical lactation	After the completion of the encounter, the actor-educator provides immediate, tailored oral feedback to the learner. Written feedback is provided after the telesimulation is completed.	Actor-educator provides oral and written feedback. Actor-educator scores communication, interpersonal, clinical skills, and knowledge according to the 10-item Formative Assessment (FAR) rubric. FAR items 1-6 are graded on a 6-point Likert scale (1= strongly disagree, 6= strongly agree) and Items 7-10 (“I know statements”) are graded on a 2-point scale (0 = missing/did not complete, 1 = needs improvement, 2 = satisfactory).
Clinical competence in documentation and clinical-decision making skills relevant to maternal-newborn health and clinical lactation	The Encounter Documentation requires the learner to bring together all of the learnings from the preparatory materials, the clinical encounter, and feedback. The Encounter Documentation should be completed within 24 hours after the telesimulation. A strict word count, time limit, and specific prompts ensure that	A clinician provides written feedback on the Encounter Documentation using the Summative Assessment Rubric (SAR). The 8-item SAR is graded on a 3-point scale (0 = missing/did not complete, 1 = needs improvement, 2 = satisfactory, 3 = excellent).



	<p>learners are engaged in answering different questions related to the maternal-newborn dyad's history and physical assessment, management plan, and physiology and pathophysiology associated with the primary concerns.</p>	
<p>Healthcare professionals' translation of clinical skills to maternal-newborn care</p>	<p>After the telesimulation in the setting of a research study, self-reported practice patterns specific to the learning objectives of the case scenario from the telesimulation are collected.</p>	<p>Close-ended, ordinal, 10-pt scale, with items presented in random order. Practice patterns should be assessed at baseline (prior to telesimulation exposure) and after telesimulation exposure (e.g., every 2 weeks, every month).</p> <p>Example items:</p> <p>In the last [e.g., 2 weeks] I...</p> <ul style="list-style-type: none"> • Assembled a hospital-grade (double-electric) breast pump for a lactating patient (0, 1...10) • Assisted a lactating patient with positioning and attaching their infant at the breast (0, 1...10)
<p>Active engagement in an online learning environment</p>	<p>In a Team telesimulation, the five-minute reflective pause midway through allows for the learners to communicate with one another to discuss optimizing the management plan or other elements of the patient's history that should be obtained. After an Individual and Team telesimulation, learners are prompted to reflect and comment on their experience.</p> <p>Preparatory materials are structured as contextualized multiple-choice questions embedded in unfolding case</p>	<p>Quantitative content analysis and thematic analysis are used to define and describe, respectively, the conversation, reflection, and experience of learners.</p> <p>Learners are required to receive a score of 5/5 on the multiple-choice questions to proceed to the next step.</p>



	scenarios. Learners review the explanations for the correct and incorrect answers.	
Interprofessional and/or team-based learning and behaviors	In a Team Telesimulation, three learners come together in one video call to provide care to one mother-newborn pair. Learners are assigned individual tasks that they should champion. Yet, learners are encouraged to collaborate with their team and speak up when teammates are struggling to effectively communicate with the patient, for example.	Certain items from the Interprofessional Collaborator Assessment Rubric are used to evaluate team behaviors.

HEALTH EQUITY

As people of color are less likely to receive high-quality lactation support and are more likely to be diagnosed with breast cancers at a later stage, increasing the representation of diverse skin tones in the training of healthcare providers will be important for improving patient outcomes. Lesions or changes in texture and color of the skin may be more difficult to detect on skin of color; therefore, early and accurate detection of abnormal findings is especially important in this population. To address this disparity in breastfeeding and breast health outcomes, it is critical that healthcare professionals are able to receive cultural competency training in how to provide lactation support to diverse families. All LiquidGoldConcept products are available in four skin tones to be used in training for culturally-competent lactation support. The actor-educators in the On-Demand Telesimulation platform select a Lactation Simulation Model in the skin tone they feel most closely matches their own to use in telesimulations. Actor-educators also select a Newborn Oral Assessment and Latch Simulator (NORALSim, patent pending) in a skin tone of their choice, representing a diversity of families. In our recent publication in the *Journal of Breastfeeding Medicine*, we highlighted the first example of a lactation simulation where learners were exposed to standardized patients from diverse backgrounds wearing a realistic breast model in a skin tone matching their own. Future work will focus on the impact of a hybrid simulation with a standardized patient on health professionals' cultural competency and the transfer of those skills to maternal-newborn care.

EVIDENCE OF EFFECTIVENESS



Healthcare professionals from different fields and across levels of training report a high degree of satisfaction and engagement with the On-Demand Telesimulation program, resulting in increased clinical competence in lactation support.

Medical students (N=12) in a virtual breastfeeding medicine elective participated in three telesimulations in a pilot program in May 2020. The Formative Assessment Rubric (FAR) scores suggest that students were prepared for the telesimulation (5.5/6) and the student's behavior during the simulated encounter was appropriate for the Case (5.4/6). There were no significant differences in a student's average FAR scores by Case at baseline ($p = 0.11$). Students' total FAR scores increased between telesimulations 1 and 2 (+24.5/114 points, $p = 0.0002$) and between telesimulations 2 and 3 (+17.5/114 points, $p = 0.01$), indicating that the students were able to learn about their performance of communication, interpersonal skills, and teaching and make adjustments to improve with continued practice with the standardized patients. Students were satisfied (4.6/6) with the Course and agreed (4.6/6) they would recommend it to medical school classmates. In open-ended evaluation responses, respondents indicated the unfolding case scenarios supported their self-directed learning ($n = 3/9$). The respondents also mentioned that the simulated, hands-on approach would result in knowledge retention ($n = 3/9$), as one student stated, "The interactive portions of the Course were very helpful and probably will make longer lasting knowledge than some of the readings." Overall, students found that the standardized patients' feedback regarding the communication and interpersonal skills was helpful, with one student writing, "standardized patients were very knowledgeable and did a very good job, better than other simulation experiences I've had so far in medical school. The focus group revealed that students were satisfied with the quality of the experience. Six of the nine students indicated the learning objectives for each telesimulation aligned with their experience with the standardized patient during the simulated encounter. Students confirmed four separate times through the duration of the focus group that the Course provided them an opportunity to practice a real-life clinical situation. Additional findings are discussed in the manuscript published in the Journal of Breastfeeding Medicine in January 2021 (DOI: [10.1089/bfm.2020.0253](https://doi.org/10.1089/bfm.2020.0253)). Preliminary data from two ongoing randomized control trials (NCT04519216 and NCT04717128) with pediatric and family medicine residents at the University of California, Davis Medical Center and pre-licensure nursing students at Johns Hopkins University School of Nursing support the findings from the pilot study with medical students described earlier.

LiquidGoldConcept products are the only expert-validated simulators for breastfeeding and breast health education that are realistic in look, feel, and functionality and proven to improve learning outcomes (DOI: [10.1186/s13006-020-0254-5](https://doi.org/10.1186/s13006-020-0254-5), DOI: [10.1186/s41077-020-00143-z](https://doi.org/10.1186/s41077-020-00143-z)).

Instruments for the evaluation of the telesimulation program are available upon request.



Section 2: Implementation Guidance

STAKEHOLDER EMPOWERMENT & COLLABORATION

The On-Demand Telesimulation program requires continual collaboration with stakeholders to ensure that the content and approach fit the needs of the target audience.

For example, in early December 2020, we worked with our first group of learners (Staff) from the Women, Infants, and Children's program (WIC). The WIC learners started with our "Foundations Workshop" where a Lactation Skills Teaching Associate provides instruction on how to perform essential clinical lactation skills: breast assessment, hand expression of breast milk, breast massage for engorgement, breast massage for plugged ducts, and assembly and effective use of breast pumps. The WIC staff commented that the language "hospital-grade breast pump" is not FDA approved. Thus, for LiquidGoldConcept's On-Demand Telesimulation program to be integrated into WIC education, the language we use to describe breast pumps should be modified. We had never received this feedback from healthcare professionals in medicine, nursing, hospital staff, or lactation consultant students. We have adapted the language we use in the On-Demand Telesimulation program regarding breast pumps, changing the word "hospital-grade" to "double-electric, multi-user."

REPLICATION

The On-Demand Telesimulation program has been incorporated into dozens of institutions across North and South America. A representative list of institutions is shown below. Health professionals seeking continuing education can receive Continuing Education Recognition Points (L-CERPs and E-CERPs) and Continuing Nursing Education (CNE) credit upon completion of the telesimulations. Students (e.g., nursing, lactation consultant) can also earn 2 clinical contact hours per hour of telesimulation.

- University of California, San Diego Extension Pathway 2 Lactation Consultant Training Program, California, United States
- United States Department of Agriculture, Supplemental Nutritional Program for Women, Infants, and Children, Michigan, United States
- Midwifery Institute, Thomas Jefferson University, Pennsylvania, United States
- Douglas College Perinatal Program, British Columbia, Canada
- Consejería en lactancia materna, Curso Virtual, Asociación de Consultores Certificados en *Lactancia Materna* de México, México



- Virtual Breastfeeding and Lactation Medicine Elective, Michigan State University College of Human Medicine, Michigan, United States
- Pediatric and family medicine residency program, University of California, Davis Medical Center, California, United States
- Hospital and School of Nursing, Johns Hopkins University, Pennsylvania, United States

INTERNAL CAPACITY

On-Demand Telesimulation decreases the burden on faculty and staff of creating, maintaining, and scheduling remote simulations for health professional learners. LiquidGoldConcept handles **all** scheduling and coordination of telesimulation, trains and maintains a cast of diverse actor-educators and interprofessional team of physicians, nurses, and lactation specialists, and develops and validates all case content and assessment rubrics. Academic institutions, clinics, and hospitals who wish to incorporate On-Demand Telesimulation into their program only need to provide LiquidGoldConcept with the names and email addresses of their learners and we will handle the rest.

PRACTICE TIMELINE

Phase: Planning/Pre-Implementation		
Activity Description	Time Needed	Responsible Party
Meet with LiquidGoldConcept to select case scenarios that best suit your learners' educational needs	1 hour	Example: Nurse educator, clinical faculty instructor



Phase: Implementation

Activity Description	Time Needed	Responsible Party
Send LiquidGoldConcept the list of learners (name/email) who will be participating in the program. LiquidGoldConcept will upload the list into their scheduling system	5 minutes	Example: Nurse educator, clinical faculty instructor
Learners complete telesimulations individually or in teams of 3	Varies by # of telesimulations	Learners and LiquidGoldConcept

Phase: Sustainability

Activity Description	Time Needed	Responsible Party
Review learners' clinical competence scores to decide whether or not learners need to review the feedback and repeat the telesimulation	Varies by # of telesimulations and learners	Example: Nurse educator, clinical faculty instructor
Purchase more telesimulations	5 minutes	Example: Nurse educator, clinical faculty instructor



PRACTICE COST

One hour of telesimulation is 'worth' 2 clinical hours. The average cost per clinical hour per learner is \$20.

Budget			
Activity/Item	Brief Description	Quantity	Total
60-minute Team Telesimulation (Group of 3 learners)	Any of the case scenarios, includes preparatory materials, 45-minutes with the patient, 15-minutes of verbal feedback, Encounter Documentation, written feedback from a clinician	1	\$90 (\$30 per learner)
(\$30 per learner)	Any of the case scenarios, includes preparatory materials, 45-minutes with the patient, 15-minutes of verbal feedback, Encounter Documentation, written feedback from a clinician	1	\$60 (\$60 per learner)
60-minute Individual Telesimulation	Any of the case scenarios, includes preparatory materials, 20-minutes with the patient, 10-minutes of verbal feedback, Encounter Documentation, written feedback from a clinician	1	\$30 (\$30 per learner)
Total Amount:			Varies depending on number of learners and number of telesimulations

LESSONS LEARNED

We have learned that we must be more transparent about the amount of time required to prepare for and debrief following the telesimulation. The preparatory materials require approximately 15-20 minutes for completion and the debrief (Encounter Documentation) requires 30-60 minutes of work (depending on the level of training of the learner) following the telesimulation. For example, for



physician residents at the UC Davis hospital, we found that residents had to complete the required educational experience during their shift. This means that someone else needs to 'hold their pager' while they are away doing the telesimulations. We had to coordinate with the pediatric fellow and the senior resident and block off a specific amount of time to allow for the residents to complete the preparatory activity and engage in the 30 minute encounter with the standardized patient without interruption.

NEXT STEPS

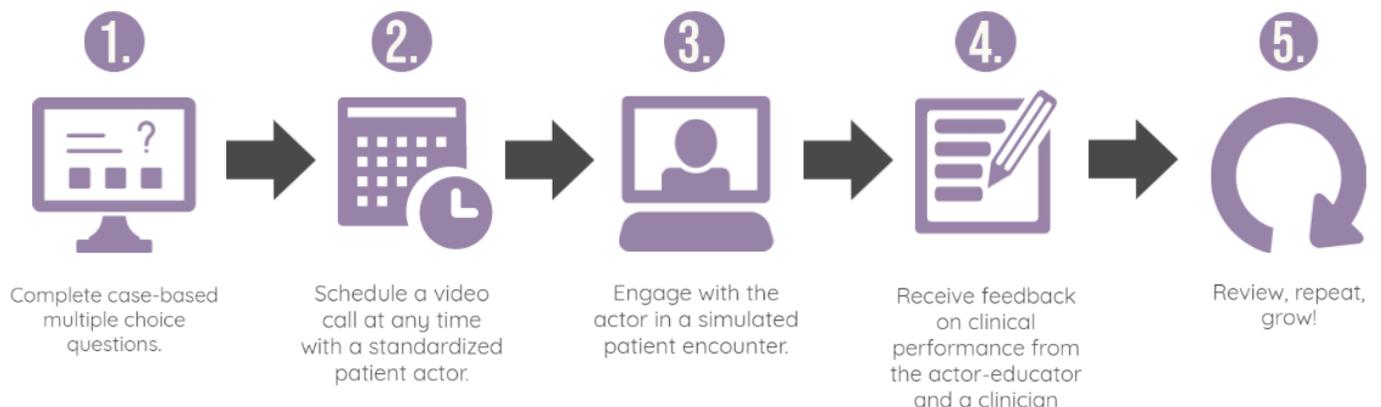
- Development of new case scenarios focused on newborn health with the Newborn Oral Assessment and Latch Simulator (NORALSim, patent pending)
- Translation of the entire On-Demand Telesimulation program to Spanish for expansion across Central and South America
- Prospective randomized control trials to define the effect using LiquidGoldConcept's solutions and products for healthcare professional education on maternal and infant health outcomes.

RESOURCES PROVIDED

- www.OnDemandTelesimulation.com
- www.LiquidGoldConcept.com

APPENDIX

- **Figure 1.** The On-Demand Telesimulation process developed by LiquidGoldConcept



- **Figure 2.** Actor-educator in the LiquidGoldConcept On-Demand Telesimulation program wearing a LiquidGoldConcept Lactation Simulation Model.

