

# Neonatal Perinatal Simulation Program



Simulation training is a mainstream educational method for residency and fellowship trainees. The Accreditation Council for Graduate Medical Education has included simulation as part of its recommended core didactic activities for residents and fellows. In partnership with the cutting-edge UCLA Simulation Center, we have created the neonatal-perinatal fellowship simulation program, which was inaugurated in July 2017.



The simulation training begins during orientation of first year fellows and continues throughout their fellowship. Trainees learn to actively apply and incorporate knowledge and cognitive functions in specific crisis management scenarios.

The **objectives** of the neonatal perinatal fellowship simulation program include:

- Integrate cognitive, behavioral, technical skills and critical thinking in dynamic, evolving crisis management scenarios
- Develop leadership skills in the NICU and the delivery room by supervising a multidisciplinary team of nurses, respiratory therapists and residents
- Enhance multidisciplinary team performance and communication skills to improve neonatal outcomes



## Boot Camp

The simulation program consists of an annual 2-day boot camp that occurs at the beginning of each academic year and is repeated mid-year as a mini 1-day boot camp refresher. The boot camp encompasses all of the following topics and procedures.

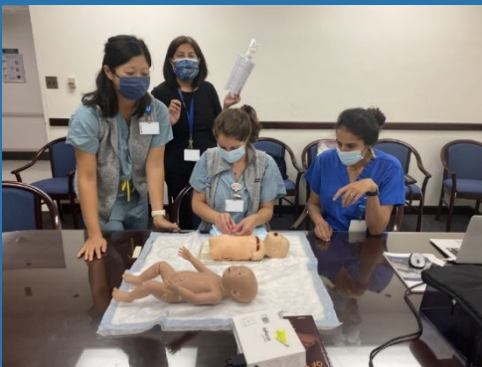
- NRP recertification for NICU fellows
- Procedural Skills Station
  - Pericardiocentesis
  - Paracentesis
  - Exchange transfusion
  - Intraosseous insertion
  - Thoracentesis
  - Chest tube insertion
  - Pigtail catheter insertion
  - Lumbar puncture
  - Umbilical venous and arterial catheterization
  - Synchronized cardioversion
  - Defibrillation
- Crisis management scenarios/mock codes
  - Arrhythmia identification and management (supraventricular tachycardia, ventricular tachycardia, ventricular fibrillation, atrial flutter, complete heart block, torsade de pointes)
  - Advanced NRP resuscitation in the delivery room and NICU
  - Cardiac tamponade requiring pericardiocentesis
  - Hydropic infant requiring thoracentesis and paracentesis in the delivery room
  - Tension pneumothorax requiring chest tube or pigtail catheter insertion



- Hyperbilirubinemia requiring exchange transfusion
- Septic shock requiring intraosseous insertion and sepsis management
- Introduction of innovative educational techniques and new NICU equipment
  - 3D printer to develop neonatal thorax cavity for chest tube insertion/thoracentesis
  - External pacemaker
  - Glidescope



## In Situ Mock Codes



In addition to the boot camp, we implement multidisciplinary in situ mock codes in the NICU. As the team leader, NICU fellows guide nurses, residents, nurse practitioners and respiratory therapists in mock codes to maintain NRP, procedural and team skills.

## NICU Faculty Simulation

Simulation for NICU faculty members is held once every 2 years at the UCLA Simulation Center for skill maintenance. Advanced procedures are demonstrated and practiced on low and high fidelity mannequins. Advanced procedures include the following:

- Pericardiocentesis
- Paracentesis
- Exchange transfusion
- Intraosseous insertion
- Thoracentesis
- Chest tube insertion
- Pigtail catheter insertion
- Lumbar puncture
- Umbilical venous and arterial catheterization
- Synchronized cardioversion
- Defibrillation



## ECMO Simulation

In collaboration with the ECMO Perfusionist Department, we introduced ECMO Simulation in February 2022. The purpose of ECMO Simulation is to develop technical, cognitive and behavioral skills for ECMO NICU crisis management situations. During ECMO simulation, we review the different ECMO circuits and participate in simulation scenarios which include NICU ECMO management and ECMO emergencies. ECMO simulation will occur annually during the July orientation week for current and incoming NICU fellows. This is just the beginning, and we hope to expand the ECMO Simulation program in the coming years.



## Point of Care Ultrasound Curriculum

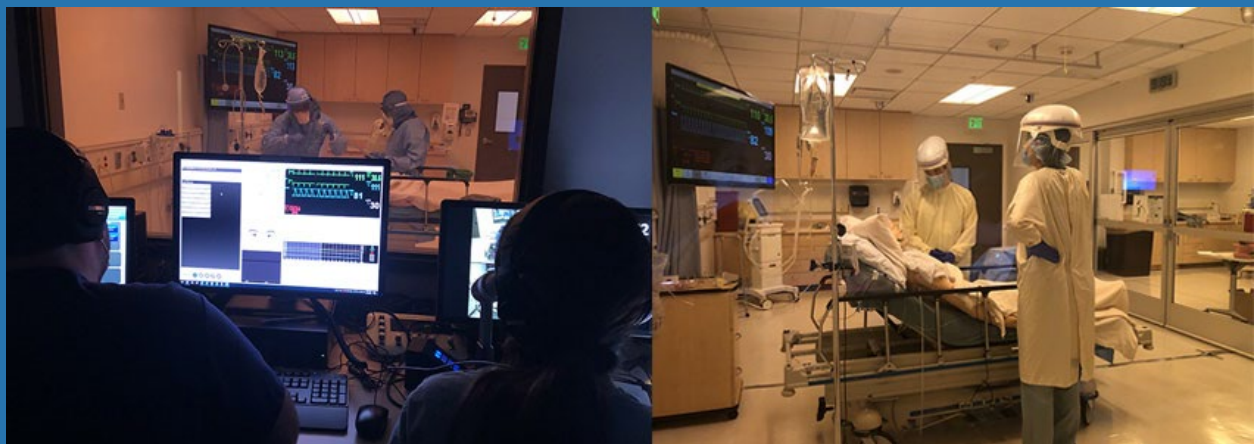


We introduced point of care ultrasound (POCUS) in the neonatal-perinatal fellowship program in early 2021. Physicians perform POCUS at the bedside, and it has become an evolving diagnostic tool. It enables physicians to augment clinical examinations and procedures. We are in the early stages of developing a POCUS curriculum for the NICU Division. Currently, we have annual trainings with the Mindray POCUS machine with low fidelity simulation, consisting of vascular access and bladder measurement. We have also included POCUS training in the annual July Fellow's orientation. Future goals for the POCUS curriculum include enhancing POCUS skills for diagnostic and procedural skills and for NICU emergencies. We continue to work closely with the UCLA Simulation Center to develop the POCUS curriculum with the goal of utilizing multiple educational modalities (bedside, simulation, and didactic learning). Stay tuned for future updates.



## UCLA Simulation Center

We have a strong collaboration with UCLA Simulation Center without which the Neonatal Perinatal Simulation Program would not have been established. The wonderful team at UCLA Simulation Center have supported our simulation education needs and much more.



## NICU Simulation Faculty Members

- Margaret Nguyen, MD
- Josephine Enciso, MD
- Nida Lovatanapongsa, MSN, MSHI, CCRN

**Keywords:** UCLA Simulation Center, Margaret Nguyen, Josephine Enciso, Nida Lovatanapongsa, boot camp, in situ mock codes, point of care ultrasound, simulation curriculum