Development of a Simulation of Neonatal Respiratory Distress Syndrome for a Resource Limited Setting

John Feister, MD

1Pediatrics, Northwestern University Feinberg School of Medicine; Lurie Children’s Hospital

BACKGROUND
- Prematurity-related complications are the leading cause of neonatal mortality worldwide
- A major contributor of neonatal mortality due to preterm birth is respiratory distress syndrome (RDS).
- Bugando Medical Center (BMC) is a tertiary referral center for the northwest region of Tanzania.
- BMC has access to a limited number of ventilators, bubble CPAP, and surfactant.

OBJECTIVE
We sought to create a simulation to teach the identification and initial stabilization of an outborn baby with RDS using the resources available to providers at BMC.

METHODS
- Informal needs assessment performed in conjunction with BMC staff to determine opportunities for simulation development
- The BMC NICU was observed to understand the available resources and current practices
- The simulation was designed using recommendations from the European Consensus Guidelines for Management of RDS and the WHO Pocket Book of Hospital Care for Children.

KEY LEARNING POINTS
- Recognize infant in respiratory distress and initiate initial evaluation and stabilization (obtain SpO2, consider CPAP, start workup – CXR, and CBC)
- Recognize that respiratory distress in an infant may not just be sepsis and start and adjust respiratory support
- Interpret CXR and lab values as RDS
- Recognize that treatment of RDS requires surfactant as well as invasive ventilatory support

FUTURE DIRECTIONS
- Virtual or in-person implementation of the simulation to elicit feedback with further optimization
- Testing to assess simulation effectiveness
- Pre and post testing to assess knowledge retention
- Monitoring uptake of RDS best practices within BMC after establishment of simulation curriculum

Figure 1: NeoNatalie mannequin
Figure 2: Pulse oximeter
Figure 3: Sample chest x-ray of RDS. Note underinflated lung fields, bilateral granular opacities, & air bronchograms.
Figure 4: Bubble CPAP machine