

Needs Assessment for Labor and Delivery Nursing NRP Training and Maintenance of Skills



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Background:

It is estimated that approximately one million neonatal deaths occur worldwide every year due to perinatal asphyxia, and approximately 10% of US newborns require basic resuscitative measures while 1% require advanced measures such as positive-pressure ventilation (PPV), at birth(1-2). These measures dramatically decrease rates of birth asphyxia. Yet, up to 16% of initial resuscitation steps are not compliant with Neonatal Resuscitation Program (NRP) guidelines and there is a 55% non-compliance rate with advanced NRP measures, such as PPV (2-3). When appropriate ventilation and oxygenation are delayed, neonates are more likely to develop cardiopulmonary collapse and require mechanical and pharmacologic support of cardiac output. While delivery hospitals are required to have neonatal intensive care providers in house 24 hours a day, they are often only called to deliveries that are deemed to have a high chance of needing neonatal resuscitation. Therefore, labor and delivery (L&D) nurses are often the first providers at unplanned resuscitations and asked to start initial NRP steps and provide PPV if necessary.

Objective:

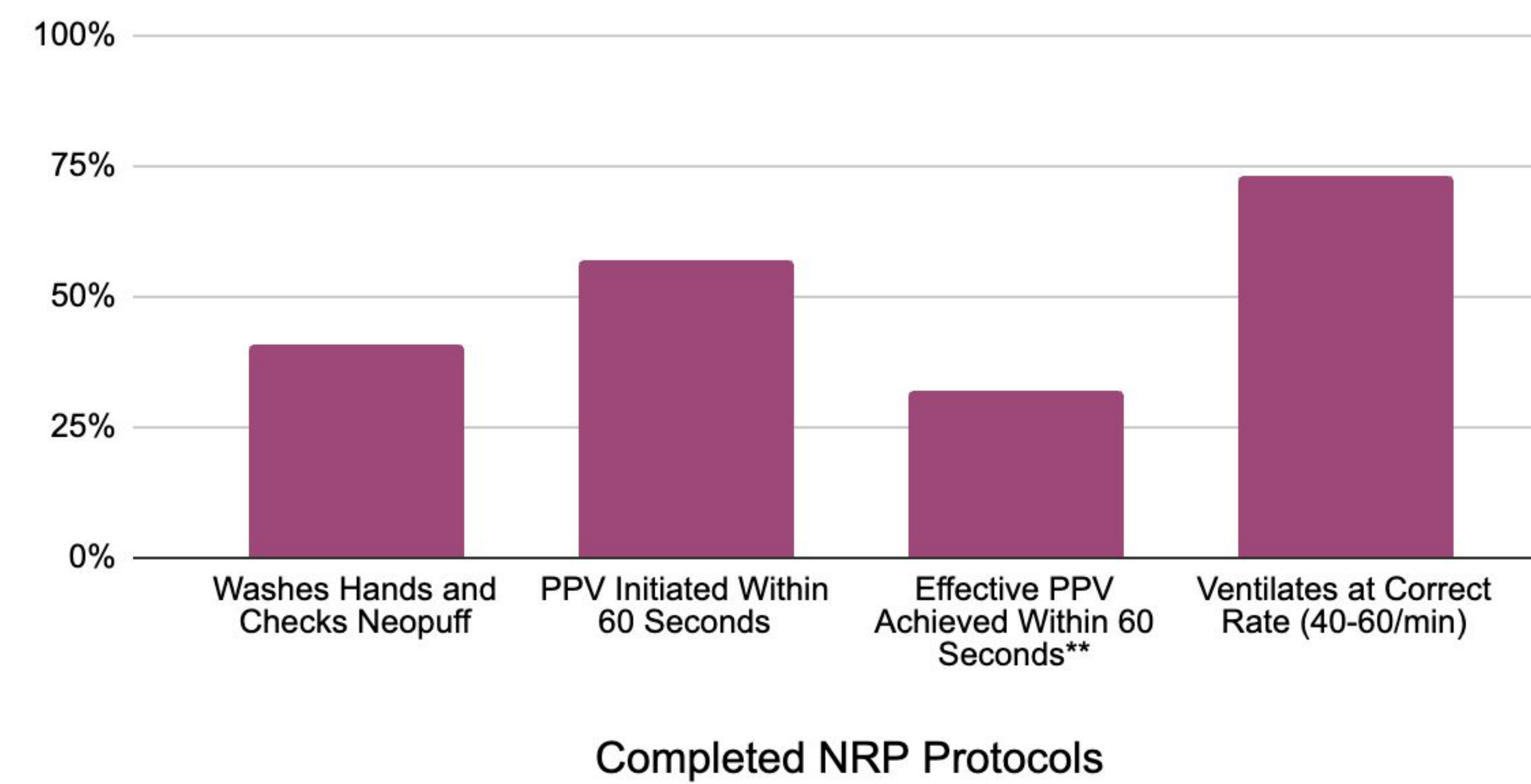
We aim to identify areas of deficit in adherence to NRP protocol by L&D nurses in the delivery room setting.

Methods:

This study was conducted at two delivery hospitals in Cincinnati, Ohio. Labor and delivery nurses volunteered to participate in the study. Participants completed a standardized manikin-based simulation involving a neonatal delivery room resuscitation scenario. Adherence to NRP protocol was assessed using a validated tool based on a neonatal resuscitation curriculum. Resuscitations were evaluated using a modified simulation tool and scored by trained study investigators. Time to initiating PPV was started when the manikin was placed on the bed and stopped with first delivered PPV. Time to effective PPV was then continued until PPV was given that induced chest rise in the manikin. Adherence assessments were reviewed by all examiners to ensure internal validity. L&D nurses reported confidence in effective NRP via 6-point Likert scale.

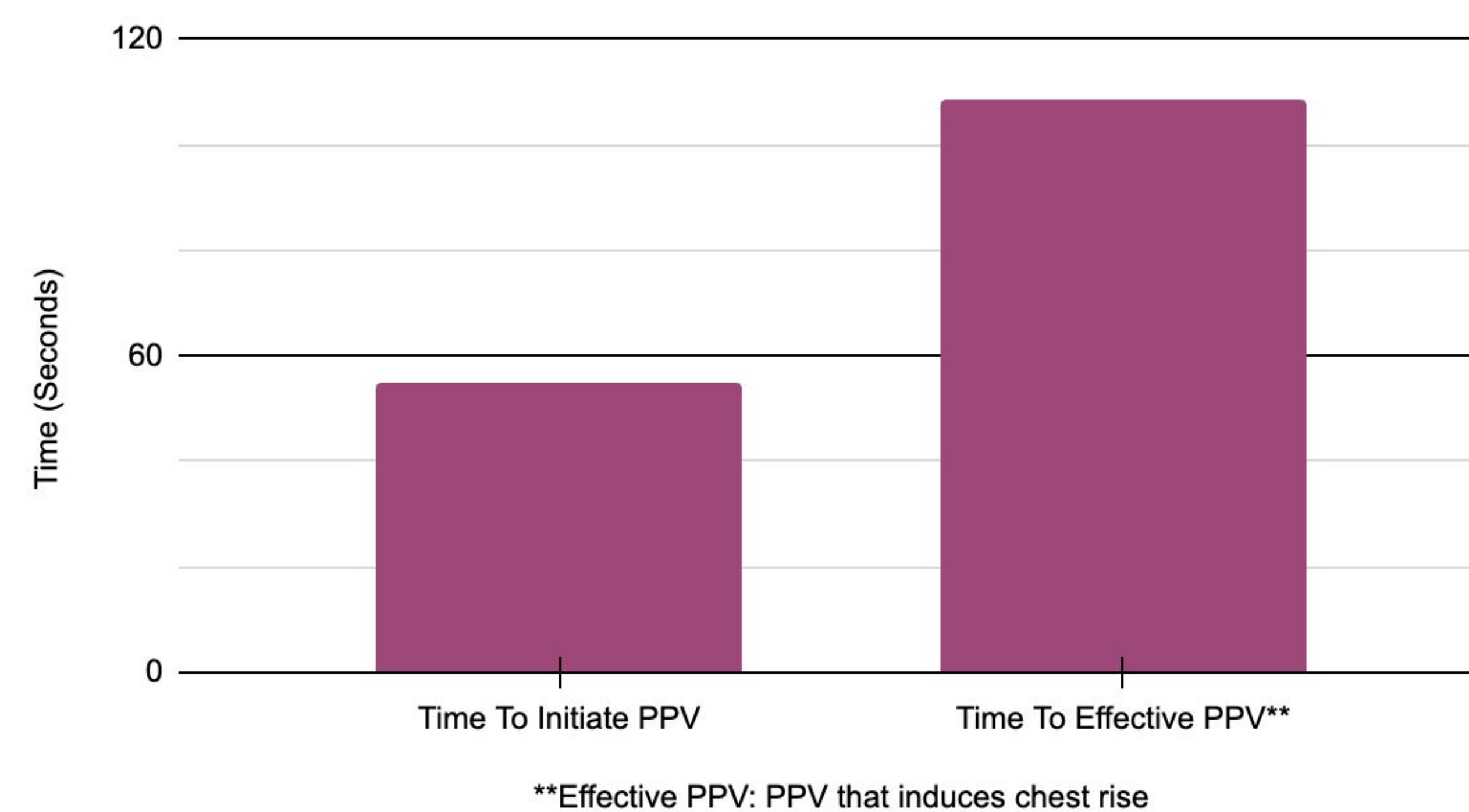
Percent of Completed NRP Protocols

**Effective PPV defined as PPV that induces chest rise



Completed NRP Protocols

Time to PPV



**Effective PPV: PPV that induces chest rise

Demographics	Median (P25, P75)
Shifts per Month	12.0 (10.0, 12.0)
Years Experience as an L&D Nurse	2.5 (1.5, 8.5)
Years Since Initial NRP Training	3.0 (1.3, 9.5)
Years Since Last NRP Training	1.0 (1.0, 2.0)
Times PPV Provided in Last 6 Months	1.0 (0, 2.0)
Level of Confidence (1-6)	4.0 (2.0, 4.0)

Results

Thirty-seven L&D nurses participated, with 2.5 years of median experience. Median time since initial NRP training was 3 years; median years since last NRP training was 1 year. L&D nurses washed their hands and checked equipment in 40.5% of resuscitations. PPV was started by one minute in 56.8% of encounters, but was only effective in 32.4%. Median time to initiate PPV was 55 seconds. Median time to achieve effective PPV was 108 seconds. L&D nurses rated confidence in performing an effective NRP as 4 out of 6, but only 57.1% of all evaluated steps were performed accurately.

Conclusions:

Our study demonstrated a significant decay in both NRP knowledge and skill retention among L&D nurses. This is demonstrated by the prolonged time it took for the majority of participants to achieve effective PPV after first initiating PPV. This could represent either knowledge decay, forgetting the troubleshooting steps to help achieve effective PPV, or skill decay, not performing the troubleshooting steps effectively.

NRP certification lasts 2 years, however this study adds to the mounting evidence that this interval between training may be too long. Multiple prior studies have found that skill decay can occur in as little as 2 months after NRP training and that providers were unaware of their own skill decay. This is consistent with our finding that L&D nurses had significant skill decay despite a high level of confidence in their own abilities (5-7).

Rapid cycle deliberate practice has been shown to improve skill acquisition and performance, along with skill retention for pediatric advanced life support training (8). This could act as a model to develop a continuing education curriculum for L&D nurses practicing NRP.

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