Resuscitation Quality Improvement Evidence
COLLEGES

I. RQI-Based: Nursing Students

Undergraduate nursing students' acquisition and retention of CPR knowledge and skills

Madden. Nurse Education Today. 2005

- Undergraduate nursing students demonstrated a significant decay of both CPR knowledge and skill 10 weeks following CPR training.

- When assessed on CPR cognitive knowledge via an exam, only 6% of learners could pass post 1-year of a CPR training course. 72% were able to immediately pass a post-test of CPR training and only 44% were able to pass a re-test 10 weeks post CPR training.

- None of the nursing students were able to demonstrate a passing score of CPR skills post 1-year of CPR training. Learners showed significant improvement in CPR scores immediately post a CPR training but showed a significant decrease in CPR skills 10 weeks following CPR training.

- The study supports existing research on the need for CPR skill acquisition and maintenance of competency over time with increased frequency of training.

Baseline Cardiopulmonary Resuscitation Skill Performance of Nursing Students is Improved After One Resuscitation Quality Improvement Skill Refresher

Kardong-Edgren et al. *Journal for Nurses in Professional Development.* 2020

- Nursing students in this study had recently completed a CPR course with an instructor and received BLS certification but, when measured objectively, were not able to meet AHA guidelines for correct demonstration of compressions and ventilations.

- Post a traditional BLS course, only 59% of nursing students demonstrated correct compression depth and 42% demonstrated correct compression rate. Overall compression scores increased by 81% post one RQI training session.

- Overall ventilation scores with the use of a bag-mask device increased by 273% (19% to 70%) after one RQI training session. This includes the ability to demonstrate adequate volume increasing by 30% and learners decreasing their ventilation rate from a pretest mean of 24.86/min to a posttest mean of 13.90/min.

- Learner outcomes in this study support prior research that indicates CPR skills are difficult to master and retain without frequent guided expert practice.

Personalized Training Schedules for Retention and Sustainment of Cardiopulmonary Resuscitation Skills

Oermann et al. *Journal of the Society for Simulation in Healthcare.* 2021

- Practice of skills with breaks in between sessions (distributed practice) is more effective for retaining skills than practice that is one all at one-time (massed practice).

- Nursing students who refreshed with 3-month or personalized prescribed intervals had overall higher compression scores compared with those who refreshed at 6-month intervals.

- After 1 year, nursing students who refreshed every 3 months had overall higher ventilation scores than those with 6-month intervals.

American Heart Association.

RQI RESUSCITATION QUALITY IMPROVEMENT®
An American Heart Association®
and Laerdal Program

Laerdal®
helping save lives

Effects of Monthly Practice on Nursing Students' CPR Psychomotor Skills Performance
Oermann et al. Resuscitation. 2011

- Differences in compression depth, ventilation volume and the percent of compressions and ventilations performed with adequate depth and volume were significant for nursing students that had brief monthly practice sessions and those that did not.

- Nursing students that received monthly practice sessions had no skills decay in accurate compression depth over 12-months, while students that did have monthly refreshers showed a significant loss of adequate compression depth beginning at 9 months and continued to decline.

- Nursing students that received monthly practice sessions steadily improved ventilation volume by 6 months, maintaining proficiency over time. Students that did not have monthly refreshers were not able to achieve correct ventilation volume over the 12-month period.

- The results also demonstrated that self-directed CPR skill practice on a manikin with some form of automated feedback was a viable option for delivering frequent practice sessions to nursing students.

Effects of Practice on Competency in Single-Rescuer Cardiopulmonary Resuscitation
Oermann et al. MedSurg Nursing. 2014

- Nursing students who practiced CPR skills each month performed more of their compressions with an adequate depth and retained this skill over the duration of 12-months versus students that did not practice CPR each month.

- Nursing students who practiced monthly CPR retained their ventilations skills when performing single-rescuer CPR, while those that did not receive monthly refreshers had lower ventilations rates and volume that decreased over time.

- From this study with nursing students, brief but frequent practice on manikins with automated feedback was an effective strategy for maintaining skills in single-rescuer CPR.

Training interval in cardiopulmonary resuscitation
Oermann et al. PlosOne. 2020

- Nursing students that were certified in basic life support, were not able to adequately perform compressions and ventilations.

- Nursing students that experienced shorter training intervals resulted in larger performance increases when compared to students in longer training intervals.

- Shorter time between training sessions, followed by distributed practice might be the most effective for developing and maintaining CPR skills over time.

II. RQI-Based: In-Hospital Providers

Longitudinal effect of high frequency training on CPR performance during simulated and actual pediatric cardiac arrest

Donoghue et al. Resuscitation Plus. 2021

- Pediatric providers enrolled in RQI had a statistically significant improvement of CPR skills between the first and last quarters of the 15-month period.

- Performance of infant compressions at the simulation station increased from 91.5% in Q1 to 95% in Q5 and infant ventilations from 82.9% in Q1 to 95.5% in Q5

- Performance of adult/child compressions at the simulation station increased from 84.3% in Q1 to 96.2% in Q5, and adult/child ventilations from 79.8% in Q1 to 95.3% in Q5

- A significant association was found between the number of prior RQI sessions and the percent of chest compressions meeting correct compression rate during the clinical event.

- Overall, 91.1% of emergency department compressions adhered to the GL Plus rate for compressions, with a median of 2 prior RQI sessions.

The Effects of a Novel Quarterly Cardiopulmonary Resuscitation Training Program on Hospital Basic Life Support Providers' Cardiopulmonary Resuscitation Skill Performance

Klacman et al. Journal for Nurses in Professional Development. 2021

- Shortened training sessions that focus on CPR skills rather than nonessential information in the course may reduce cognitive load and improve CPR quality.

- Using quarterly, brief CPR training at a skills station, hospital BLS providers who failed to meet CPR performance measures during the first quarter quickly improved on the skills necessary to meet CPR measures. For example, learners not meeting target compression depth increased from 51.1% in Q1 to 78.8% by Q2 and then 84% in Q4 for percentage of compressions with correct depth.

- Providers that met CPR measures during the first quarter maintained that performance over time with a quarterly model.

- Nurse educators should consider incorporating innovative CPR education strategies that focus on spaced learning with immediate feedback.

Low Dose-High Frequency, Case Based Psychomotor CPR Training Demonstrates High Levels of Program Compliance With Good CPR Quality Metrics

Panchal et al. Circulation. 2015

- Performance metrics from this study demonstrate high-quality CPR in Q2 and Q3, indicating CPR skill retention. In combined exercises (Q4), compressions are improved while ventilations deteriorate.

- Program compliance was high through four quarters of training.

Low Dose-High Frequency, Case Based Psychomotor CPR Training Improves Compression Fraction For Patients With In-Hospital Cardiac Arrest

Panchal et al. European Resuscitation Council. 2020

- Compression fraction improved pre- to post-RQI, from 83% to 93%

- Program compliance was high through four quarters of training.

- Improved compression fraction was associated with increased compressions/min.

Implementation of a Low-Dose, High-Frequency Cardiac Resuscitation Quality Improvement Program in a Community Hospital

Dudzik et al. The Joint Commission Journal on Quality and Patient Safety. 2019

- Providers demonstrated an increase of compression scores from a median score of 84% in Q1 to 89% in Q4.

- For ventilation scores, providers decreased their number of attempts to pass from Q1 to Q4 with the number of attempts decreasing from 2 to 1.

- Over half of participants (67.4%) agreed or strongly agreed that RQI was their preferred method of BLS training versus the traditional 2-year model.

- 81.8% of participants provided feedback on what they like about the RQI program, including ands-on practice, real-time feedback, repetition, and self-directed learning.

- Pre- and post-RQI learning, participants responded with an increase in confidence of being able to perform basic life support.