

# Improving the Quality of Cardiopulmonary Resuscitation Through Effective Preliminary Training

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# Improving the Quality of Cardiopulmonary Resuscitation Through Effective Preliminary Training

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## BACKGROUND

Approximately 209,000 in-hospital cardiac arrests (“code blues”) occur in the United States each year,<sup>1</sup> and survival is contingent on effective cardiopulmonary resuscitation (CPR). Increasingly, the quality of clinical CPR performance is not acceptable due to inefficient execution of protocol and chest compressions out of the advised range of 100 to 120 compressions per minute.<sup>2</sup>

## OBJECTIVES

- To develop a Level 2 (measuring learning) evaluation instrument that captures self-reported metrics regarding CPR skill
- To improve the effectiveness of LVHN’s CPR training curriculum by addressing protocol elements most commonly missed by newly hired nurses
- To ensure that clinicians are fully equipped with the skills necessary to provide high-quality CPR to patients

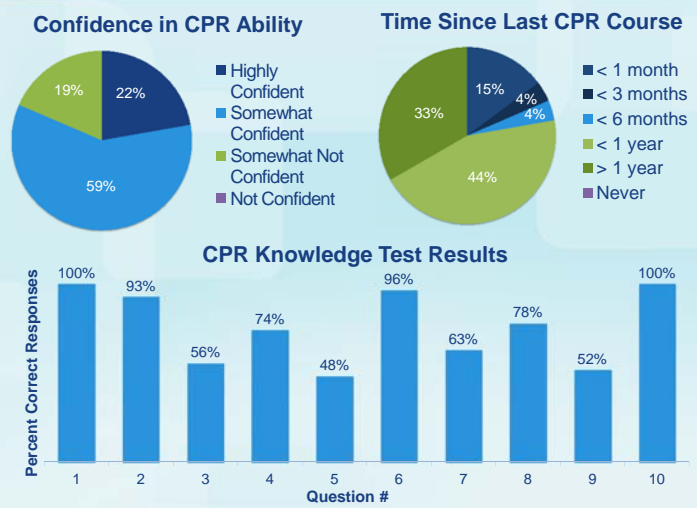
## METHODS

- Survey**
  - Development of a Level 2 evaluation instrument, consisting of a 10 question knowledge test & 2 CPR experience questions
  - Distribution of pre-assessment survey via email prior to course
- Training**
  - 39 newly hired nurses completed a clinical CPR course through the LVHN Department of Education
- Simulation**
  - 4/5 nurse teams attempted to resuscitate a manikin experiencing cardiac arrest in a mock code blue simulation
  - A debriefing with feedback followed the simulation
- Evaluation**
  - Evaluation of CPR performance using video recordings of the simulation for data collection



The manikin and mock hospital room used for CPR simulations

## RESULTS



The figures above are graphical representations of the survey responses completed by 27 of the 39 participants. The top two figures indicate the participants' previous experience with CPR. The bar chart displays the results of the knowledge test given prior to partaking in the CPR course.

### CPR Simulation Data

Group #	V-Fib Started	Pulse Checked	Code Blue Call (555)	Compression Started	Ventilations Started	1st Shock	1st Epi	2nd Shock	Compression Rate (Compression /min)
1	0:00	0:29	-	1:00	1:25	4:17	-	-	92
2	0:00	-	-	0:50	1:29	2:31	4:13	-	90
3	0:00	0:14	0:23	1:11	1:20	1:38	3:13	3:40	102
4	0:00	0:15	0:22	0:40	1:14	1:57	2:40	4:09	120
5	0:00	-	0:15	0:22	0:40	1:21	-	-	90
6	0:00	0:07	0:21	0:30	0:59	1:46	2:41	-	105
7	0:00	0:15	0:22	0:35	0:59	1:33	2:07	3:08	111

The chart above displays the amount of time elapsed from start of the drill to when each group executed various code blue protocol elements. The drill stopped after approximately four minutes. A dash indicates that an element was not performed due to forgetfulness, lack of time, or resuscitation of the patient. The compression rate for each group is also recorded.

## DISCUSSION

- Most participants reported prior experience with CPR.
- The majority (81%) of participants had moderate to high confidence in their ability to perform high-quality CPR.
- Commonly missed test question topics (< 65% correct):
  - Acceptable rate and depth of chest compressions
  - Need for physician approval to administer epinephrine
  - Avoidance of breaks longer than 10 seconds
- 3 out of 7 groups did not perform chest compressions within the acceptable range of 100 to 120/min.
- Groups often experienced unnecessary and lengthy interruptions to chest compressions.
- From observation, most groups struggled with:
  - Efficiency completing protocol
  - Set up and use of the defibrillator
  - Following steps to optimize compression effectiveness
- During debriefing, nurses described the mock code blue as both fast paced and disorienting.

## CONCLUSIONS

- To optimize the effectiveness of LVHN's CPR training course, LVHN should:
- Address factors that inhibit efficient execution of code blue protocol
  - Adjust the curriculum to address knowledge gaps and simulation mistakes
  - Require learners to repeat the simulation

## FUTURE DIRECTIONS

Reassessment of this group of learners will take place six weeks after the initial training session, when they return for a second course. Learners will complete the knowledge test again and repeat the code blue simulation. Evaluation will be necessary to determine if their performance improved.

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