2019

Improving Cardiac Arrest Outcomes with Hands-Only CPR

Ethan Witt
University of Vermont

Follow this and additional works at: https://scholarworks.uvm.edu/fmclerk

Part of the Medical Education Commons, Primary Care Commons, and the Public Health Commons

Recommended Citation
Witt, Ethan, "Improving Cardiac Arrest Outcomes with Hands-Only CPR" (2019). Family Medicine Clerkship Student Projects. 429.
https://scholarworks.uvm.edu/fmclerk/429

This Book is brought to you for free and open access by the Larner College of Medicine at ScholarWorks @ UVM. It has been accepted for inclusion in Family Medicine Clerkship Student Projects by an authorized administrator of ScholarWorks @ UVM. For more information, please contact donna.omalley@uvm.edu.
Improving Cardiac Arrest Outcomes with Hands-Only CPR

Ethan Witt
The Robert Larner, M.D. College of Medicine at The University of Vermont
Rotation 6, December 2018 – January 2019
Stowe, Vermont
Project Mentor: Katherine Marvin, M.D.
Bystander CPR is one of the most effective and necessary components of cardiac arrest management, increasing the survival rates by two to three times. However, rates of bystander CPR are inadequately low. There are several reasons for bystander hesitancy to perform CPR:

- Concerns for disease transmission through mouth-to-mouth ventilation
- Poor skills retention
- Lack of confidence
- Fear of litigation

*Only 15-30% of sudden cardiac arrest victims receive bystander CPR!*
Hands-only CPR has been found to be an effective intervention in the management of cardiac arrest.

- A study by the SOS Kanto study group found that “Cardiac-only resuscitation by bystanders is the preferable approach to resuscitation for adult patients with witnessed out-of-hospital cardiac arrest, especially those with apnoea, shockable rhythm, or short periods of untreated arrest.”  

- Hoeyweghen et al found that, while hands-only CPR was inferior to conventional CPR, both were superior to no intervention, even when performed incorrectly.  

- Instructions for hands-only CPR are easier to deliver by dispatchers and easier to recall in an actual emergency.  

- Animal models have shown that the addition of ventilations to chest compressions do not improve survival.  

- Urban et al surveyed 532 subjects and found that while only 23.3% had prior knowledge of hands-only CPR, 77.8% would be willing to perform it on a stranger.  

- Good Samaritan Laws in Vermont protect a layperson who is volunteering to deliver emergency medical care in the form of “reasonable assistance”.  

![Cardiac Arrest Patients with a Favorable Neurological Outcome](image)
According to the Vermont county profiles for health professions for 2015, the heart disease death rate in Lamoille County is 151 per 100,000 residents. This represents a leading cause of death in Lamoille County and is significantly higher than the Vermont heart disease death rate of 138 per 100,000 Vermonters.\(^{(9)}\)

Due to the high death rate from heart disease it is essential to educate as many citizens as possible about the benefits of bystander CPR. This has the potential to decrease mortality for the Lamoille County population, as well as decreasing the financial cost and increased morbidity for patients who have worse outcomes after receiving inadequate pre-hospital care.

![Heart Disease Death Rate per 100,000\(^{(9)}\)](chart)
Katherine Marvin, M.D.
*Medical Doctor at Stowe Family Practice, Stowe, VT*

Dr. Marvin expressed interest in the project and surprise at the efficacy of hands-only CPR. She was enthusiastic about organizing a demonstration of hands-only CPR at her children’s school.

Carrie Wilson
*Principal of Bishop Marshall School, Morristown, VT*

“This opportunity has provided our community with knowledge which may help to save a life in a medical event that might occur at home, school, or in a public place. I’m so grateful that Ethan took the time to demonstrate this vital skill. Thank you!”

This photograph was used with permission from Carrie Wilson
Intervention and Methodology

With the help of Dr. Marvin, I organized two demonstration events: one at Shaw’s Supermarket in Stowe, VT, and one at Bishop Marshall School in Stowe, VT. The materials at each demonstration included:

- 1 Resusci Anne CPR mannequin
- 1 poster describing the process of hands-only CPR
- 2 fliers printed from the AHA website containing:
  1. a two step description of hands-only CPR
  2. detailed information on the impact of cardiac arrest and CPR and encouragement to become formally certified
- A list to track the county of residence for those utilizing the demonstration

Retrieved from https://cpr.heart.org/AHAEC/CPRAndECC/Programs/HandsOnlyCPR/UCM_475516_Hands-Only-CPR-Training-Videos-and-Playlist.jsp
Dr. Marvin and I engaged interested community members in a conversation about CPR and assessed their knowledge of hands-only CPR. If they wanted more information, we provided a demonstration including:

- Education as to the efficacy of hands-only CPR compared to conventional CPR
- Clarification that this method of CPR is only appropriate for teenagers and adults
- Clarification that conventional CPR training is required for management of pediatric cardiac arrest
- Information as to why CPR training is important from a community health perspective
- Information about Good Samaritan laws in Vermont
- A brief description of the process involved in administering effective hands-only CPR
- A demonstration of effective technique
- The opportunity to practice CPR on a mannequin
- Clarification that this was a demonstration only and they were receiving no certification by participating

The county of residence was recorded for every person who was interested in talking about hands-only CPR and the total number of participants was noted for each event.

This photograph was used with permission from Jeremy Gilmond
Results

Shaw’s Supermarket Participants  
Stowe, VT  
28

Bishop Marshall School Participants  
Stowe, VT  
30

58 Total Participants Separated by County of Residence

- Lamoille, VT: 41
- Washington, VT: 6
- Franklin, VT: 1
- Tompkins, NY: 2
- Beaufort, NC: 1
- Walworth, WI: 2
- San Francisco, CA: 2
- Unknown: 3
Evaluation of Effectiveness and Limitations

**Evaluation of Effectiveness:**
- Determine the total number of deaths from cardiac arrest in Lamoille County from 2018 representing the death rate prior to the intervention. Compare this number to the total number of deaths from cardiac arrest in Lamoille County in 2019 representing the death rate after implementation of the intervention. The effectiveness of the intervention of hands-only CPR demonstrations can be assessed by a change in death rate from 2018 to 2019.

**Limitations:**
- The total number of people participating in the demonstrations was likely too low to observe a county-wide effect on the death rate from heart disease.
- We did not distinguish between participants who practiced CPR on a mannequin and those who only spoke with us. Additionally, we had no way to track people who may have been interested, but only read our poster without engaging us.
- The total amount of time spent with each participant in the demonstration varied drastically depending on the level of interest of the participant.
- Several young participants from Bishop Marshall School were too small in stature to effectively administer CPR on a teenager or adult.
Partner with Copley Hospital, the American Heart Association, and/or the American Red Cross:
A more concerted effort could be made to partner with any of the above organizations to coordinate formalized training sessions for hands-only CPR in Lamoille County. Events could be advertised through local newspapers, schools, healthcare facilities, EMS, fire departments, and social media to train as many people as possible.

Coordinate with local schools to make them aware of hands-only CPR training kits for teachers:
The American Heart Association has relatively inexpensive hands-only CPR training kits which schools can purchase for their teachers to train their classes in hands-only CPR. These kits allow teachers to instruct 10-20 students at a time with training materials provided by the kits. This could be an exciting project because it would target a large population at a young age.
Expand the scope of the project to include the method by which EMS and hospitals manage cardiac arrests:

Santa Barbara County in California drastically altered the methods by which their fire and ambulance crews managed cardiac arrest patients in the field. Between 2012 and 2015, they saw an increase in the percentage of survival to hospital discharge after a bystander-witnessed cardiac arrest with a shockable first rhythm from 26.9% to 57.9%. This was likely due to a concerted county-wide effort to train as many citizens as possible in hands-only CPR and the transition to a continuous high-quality chest compression model for EMS crews.\(^{(4)}\)
References


