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Findings from a tandem clinician leadership intervention for emergency department cardiac arrest care during the COVID-19 pandemic

Harman S. Gill, MD [a,b,1], Phuong H. Nguyen, BA [a,*], Kayla A. Fay, MPH [b], Frank DelGaudio, RN, BSN [b], Matthew Roginski, MD, MPH [b], Patricia Ruth Atchinson, DO [b], Evie Marcolini, MD [b]

[a] *Geisel School of Medicine at Dartmouth, Hanover, NH, USA*
[b] *Department of Emergency Medicine, Dartmouth-Hitchcock Medical Center, Lebanon, NH, USA*

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ABSTRACT

Introduction: Cardiopulmonary arrest (CPA) care in the Emergency Department (ED) has had to be modified during the coronavirus disease (COVID-19) pandemic. Scarce literature exists on comfort of clinicians (defined as physicians, nurses & advanced practice providers-APPs) in these new roles and their perceived understanding of new algorithms.
Methods: Routine CPA care in our ED was modified during the COVID-19 pandemic. This involved clinicians in shared leadership roles alongside COVID-19 specific changes to CPA algorithms. The new protocol was operationalized through a two-step educational intervention involving didactic education and in-situ simulations. Univariate analyses using student's *t*-test assessed effectiveness of this educational intervention with clinician comfort as team leaders and perceived knowledge as primary outcomes on a scale of 1 (strongly disagree) to 5 (strongly agree). Subgroup analysis across physicians (attending & resident), nurses & APP's were also undertaken with an alpha of 0.05, and p values <0.05 were considered statistically significant. Secondary outcomes of task saturation, procedural safety and error prevention were also analyzed.
Results: Across 83 of 95 total participants, our primary outcome of clinician comfort in the team leader role improved from a mean value of 3.41 (SD: 1.23) pre-intervention to 4.11 (SD: 0.88) with a p-value <0.001 post intervention. Similar and statistically significant findings in clinician comfort were noted across all subgroups except attending physicians and APP's. Perceived knowledge increased from a mean value of 3.54 (SD: 1.06) pre-intervention to a mean value of 4.24 (SD: 0.67) with a p-value <0.001 post intervention. Similar and statistically significant findings in perceived knowledge were noted across all subgroups except APP's. Responses were registered in either the strongly agree or agree category with regards to task saturation (89%), procedural safety (93%) and error prevention (71%) across all clinicians post intervention.
Conclusion: Our pilot investigation of the effectiveness of an educational intervention of a novel CPA protocol in the ED during the COVID-19 pandemic reached statistical significance with regards to clinician comfort in shared leadership roles and perceived knowledge. These findings suggest that the protocol is rapidly teachable, usable and can be efficiently disseminated across ED clinicians of varying experience, especially in pandemic settings. Further work regarding effectiveness of this new protocol in real life cardiac arrest scenarios is warranted.

1. Introduction

Many resuscitation protocols across emergency departments (ED) have undergone modifications during the coronavirus disease (COVID-19) pandemic. Historically, the resuscitation of patients in cardiopulmonary arrest (CPA) in the ED has been in large, multidisciplinary teams [1,2]. While prior iterations of the advanced cardiac life support (ACLS) guidelines have advocated for these large teams [1-5], more recent guidance has recommended against such team configurations owing to significant risk of healthcare worker (HCW) exposure during a pandemic [6-10].

As part of our institution's response in the ED to CPA care during the COVID-19 pandemic, a combined nursing and physician-based leadership model of cardiac arrest care was devised and instituted. The primary intention behind this change was to limit HCW exposure during

* Corresponding author at: Department of Emergency Medicine, 1 Medical Center Drive, Lebanon, NH 03756, USA.
E-mail addresses: Harman.S.Gill@hitchcock.org (H.S. Gill), Phuong.h.nguyen.med@dartmouth.edu (P.H. Nguyen).
[1] First author: Harman S. Gill, MD, Department of Emergency Medicine, 1 Medical Center Drive, Lebanon, NH 03756.

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a resuscitation where significant Aerosol Generating Procedures (AGP's) would occur [6]. A secondary intention was to use this unique opportunity to share the responsibility of code team leader with nursing personnel as physician shortages were anticipated. In correspondence with other academic ED's, this practice has sometimes been referred to as nurse led codes. To the best of our knowledge, there is scant to no formal literature on outcomes associated with nurse led codes in the ED setting and certainly not during pandemic settings [11-16]. This study will present the findings of an educational intervention on perceived knowledge and clinician comfort of a novel CPA protocol with joint physician and nursing leadership in an academic ED setting during the COVID-19 pandemic.

2. Materials and methods

Dual Emergency Medicine and Critical Care Medicine boarded physicians and core nursing representatives in our department designed a protocol specifically for the care of patients with CPA in the ED during the COVID-19 pandemic. Ideal team member composition and specific roles in this protocol are shown in Appendix A. Exact team composition for this study consisted of five essential HCW's consisting of: one MD physician, two registered nurses (RN's), 1 licensed practical nurse (LPN), and one respiratory therapist (RT). The major difference between this protocol and prior protocols was a shared and interchangeable role of code team leader between nursing staff and physicians. The protocol was designed to ideally have a physician leader in charge of the physician and RT personnel and a nursing leader in charge of the nursing and licensed nursing assistant (LNA) personnel. In specific, physicians-controlled processes such as airway management, execution of procedures and decisions around termination of resuscitative efforts. Similarly, nursing personnel were in charge of the algorithmic portions of the specific ACLS algorithm being carried out. Specific tasks included medication administration, maintenance of CPR quality, timely defibrillation and strict compliance with personal protective equipment (PPE) requirements. Additionally, the design restricted the total number of HCW's and equipment taken within the room.

After this protocol was designed, we undertook a two-step intervention for the dissemination and familiarization of this new protocol with all providers in the ED. The first step involved didactic training which included educational sessions at faculty meetings, didactic resident lectures, daily nursing huddles, emailing staff list serves and the placement of laminated cards with this protocol (Appendix A) in each room in our ED. The second step involved an in-situ simulation of this protocol with the entirety of the proposed team in the ED twice daily for approximately two weeks. Specific details of the in-situ simulation are described in the Appendix B. We coined the term Tandem Codes to reflect the joint physician and nursing code team leadership in this new model. Approximately, three weeks after the simulations ended, an anonymous ten question survey (Appendix C) was sent to the entire staff in the ED and results were analyzed. These responses were asked of all respondents on a subjective scale divided in the sub-categories of: Strongly Agree, Agree, Neither Agree/Disagree, Disagree or Strongly Disagree. This process of protocol design, educational dissemination and timing of survey is summarized in Appendix D.

Our null hypothesis was that prior physician led code team models would be no different to tandem physician and nursing led code teams with regards to confidence in leading the team and perceived knowledge. Our primary outcomes were: clinician self-rating of confidence in leading the ED based CPA teams and perceived knowledge of the new model (cumulative across all participants). Secondary outcomes were: assessment of confidence as team leaders and perceived knowledge of the new model across clinical subgroups (nursing, attending physicians, resident physicians and APP's), provider self-rating of task saturation, procedural safety and error prevention during CPA in this novel protocol as compared to the prior practices. Throughout this manuscript, the term 'clinicians' refers to the combined group of physicians, nurses and APP's. APP's in our study are a combined set of advanced practice nurse practitioners and physician assistants.

All statistical analyses were done in a blinded fashion by the authors. Authors only knew the designation of respondents within the ED (attending, resident, nurse, APP) and their years of experience. The authors did not have any relevant and reportable conflicts of interest and this study was deemed exempt by the institutional review board as no patient health information was involved. We conducted our initial data analysis via qualitative bar graphs for both the primary and secondary outcomes. Subsequently univariate analyses were done by converting subjective survey responses to a numerical scale 1–5, where a score of 1 corresponded to Strongly Disagree, score of 2 for Disagree, score of 3 for Neither Agree or Disagree, a score of 4 for Agree, and a score of 5 for Strongly Agree. Descriptive statistics were conveyed as mean $\pm$ standard deviations. To assess for differences in pre- and post-test responses, with a p-value derived from a student's t-test. P-values <0.05 were considered statistically significant. Statistical analysis was performed using Stata/IC (College Station, TX: StatCorp LLC).

The following are abbreviations: ED-emergency department, CPA-cardio-pulmonary arrest, ACLS-advanced cardiac life support, HCW-healthcare worker, AGP's-aerosol generating procedures, LNA-licensed nursing assistant. PPE-personal protective equipment, RN-registered nurses, APP-advanced practice providers, and POCUS-point of care ultrasound.

3. Results

After didactic education of the entire ED staff, we had 95 respondents to our final survey (Table 1). As shown in Appendix D, 12 participants were excluded from final analysis, as these respondents did not partake in the simulation portion of our two-step intervention. Of the final 83 clinicians analyzed, there were 34 physicians, 44 nurses and 5 APP's of varying experience and seniority. This translates to an overall response rate of 89% amongst attending physicians, 61% amongst resident physicians, 100% amongst APP's and 88% amongst nursing personnel. Within the physicians, there were 23 attending physicians and 11 resident physicians. Years of experience amongst practitioners were analyzed in two main categories: 0–10 years and over 10 years. Cumulative attending and resident physician years of experience revealed a value of 17/34 for 0–10 years and $n = 17/34$ for over 10 years of experience. Amongst attending physicians only there were 6/23 (26%) who had 0–10 years of experience and 17/23 (74%) who had over 10 years of experience. Across nursing personnel, there were 31/44 (70%) who had 0–10 years of experience and 13/44 (30%) who had over 10 years of experience. All resident physicians had less than three years of cumulative experience. All APP's had less than 10 years of experience. The two-step intervention seems to have been preferentially been taken by senior attending physicians and relatively junior nursing personnel in terms of years of experience.

Across all participants, clinician comfort as team leader of a tandem-led code increased after the two-step intervention. As shown in Fig. 1,

Table 1
Tabulated values of participants who underwent the emergency department (ED) two-step intervention and responded to the ten question survey.

Participants	Number of Participants	Number of Participants with 0–10 years of ED experience	Number of Participants with >10 years of ED experience
Attending	23	6	17
Resident	11	11	0
All Physicians	34	17	17
Nurses (RN)	44	31	13
Advanced Practice Providers (APP)	5	5	0

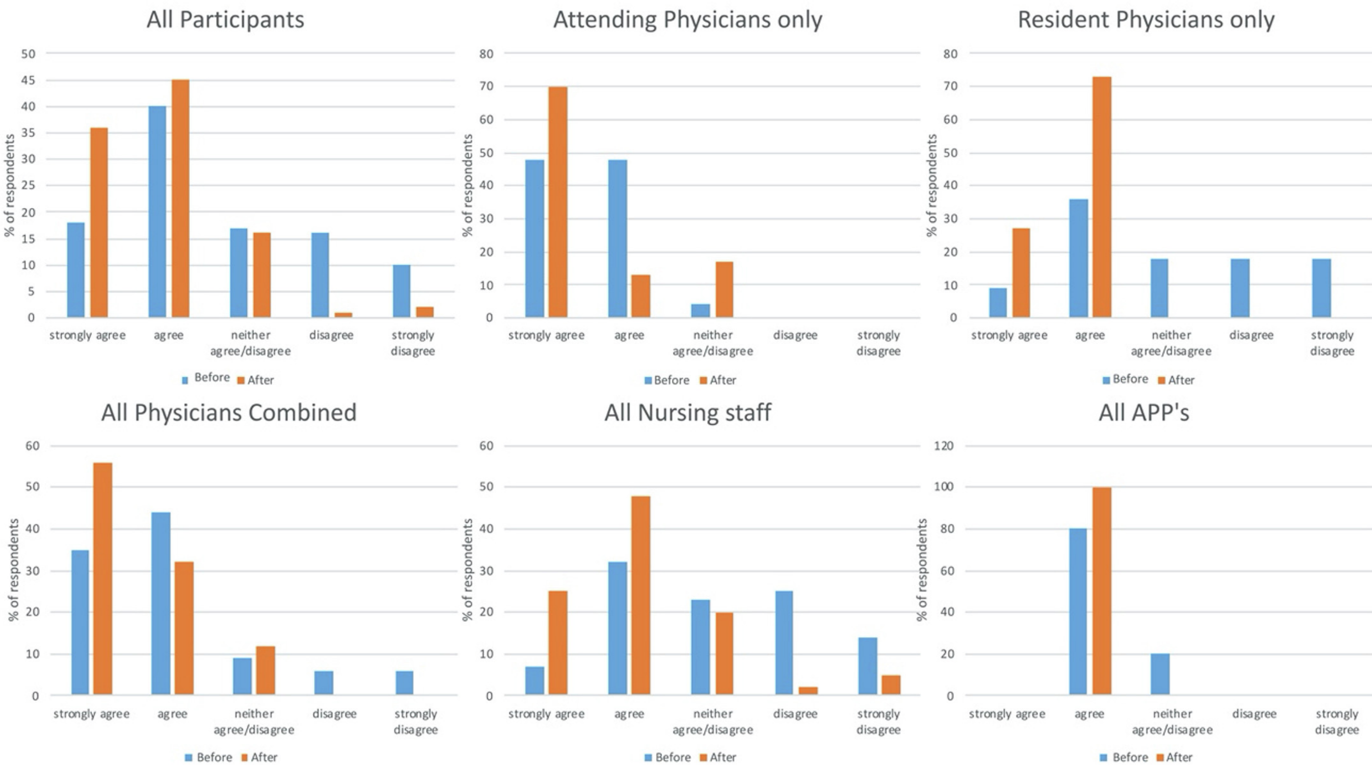

Fig. 1. Provider responses across all subsets of designations showing perceived comfort level as team leader before and after in-situ simulation experience.

the intervention seemed to simultaneously increase clinician comfort and reciprocally decrease clinician discomfort for the role of team leader across all clinician groups. On average, clinician comfort level before and after the intervention amongst all participants was 3.41 ($\pm$1.23) and 4.11 ($\pm$0.88), respectively with a p value <0.001 (Table 2). The positive increase reflects a statistically significant transition from the neutral neither agree or disagree category towards the agree category for perceived clinician comfort amongst all surveyed participants. Clinician subset analysis in Table 2 also displayed this statistically significant and positive transition in self-reported comfort as team leaders in this new protocol. The only exceptions were the groups of attending physicians and APP's. Both groups showed positive deflections in their mean values but did not reach statistical significance.

Across all participant, perceived knowledge of the new tandem-led code protocol also increased after the two-step intervention. As depicted in Fig. 2, the intervention seemed to simultaneously increase perceived knowledge and reciprocally decrease deficits in perceived knowledge across all clinician groups. On average, perceived knowledge before and after the intervention amongst all participants was 3.54 ($\pm$1.06) and 4.24 ($\pm$0.67), respectively with a p value <0.001 (Table 3). The positive increase reflects a statistically significant transition from the neutral neither agree or disagree category towards the agree category for core knowledge amongst all surveyed participants. As seen in Table 3, all subsets of clinicians also displayed this statistically significant and positive transition in their perceived knowledge of the new protocol. The only exception was the group of APP's, where there was a positive deflection in its mean value but did not reach statistical significance.

Table 2
Average provider responses across all subsets of designations showing perceived comfort level as team leader before and after in-situ simulation experience

Participants	Pre-Mean (SD)	Post-Mean (SD)	p-value*
All Participants	3.41 (1.23)	4.11 (0.88)	<0.001
Attending	4.43 (0.59)	4.52 (0.79)	0.674
Resident	3.00 (1.34)	4.27 (0.47)	0.008
All Physicians	3.97 (1.11)	4.44 (0.70)	0.041
Nurses (RN)	3.00 (1.18)	3.99 (1.00)	<0.001
Advanced Practice Providers (APP)	3.80 (0.45)	4.00 (0)	0.347

* p-value from Student's TTest.

In general, tandem-led codes were reported to reduce the amount of task saturation for the physician (Fig. 3). Across all participants, 40% Strongly Agree, 48% Agree, 10% Neither Agree or Disagree, 2% Disagree and 0% Strongly Disagree (Table A.4). This trend was sustained across all subsets of clinicians except nursing personnel. Specifically and in contrast to their physician and APP counterparts, nursing personnel had the highest proportions that either responded in the Disagree or Neither Agree or Disagree category.

As shown in Fig. 3, tandem-led codes were reported to allow the physician more time to focus on procedures such as airway management, placement of intra-vascular catheters and performance of point of care ultrasound (POCUS). Across all participants, 51% Strongly Agree, 42% Agree, 7% Neither Agree nor Disagree, 0% Disagree and 0% Strongly Disagree (Table A.5). No notable differences were found in the overall responses from each individual subgroup.

As shown in Fig. 3, tandem-led codes were self-reported to be helpful in reduction of all error subtypes during a CPA. Across all participants, 31% Strongly Agree, 40% Agree, 29% Neither Agree nor Disagree, 0% Disagree and 0% Strongly Disagree (Table A.6). Most clinicians in the subsets of designations registered their responses in the Strongly Agree or Agree category and no subset had any responses in the 'Disagree or Strongly Disagree' category. Of note, this question had the highest number of neutral responses with 29% of responders registering their answer under the 'Neither Agree or Disagree' category. The subset with highest proportion of these neutral responses was nursing personnel.

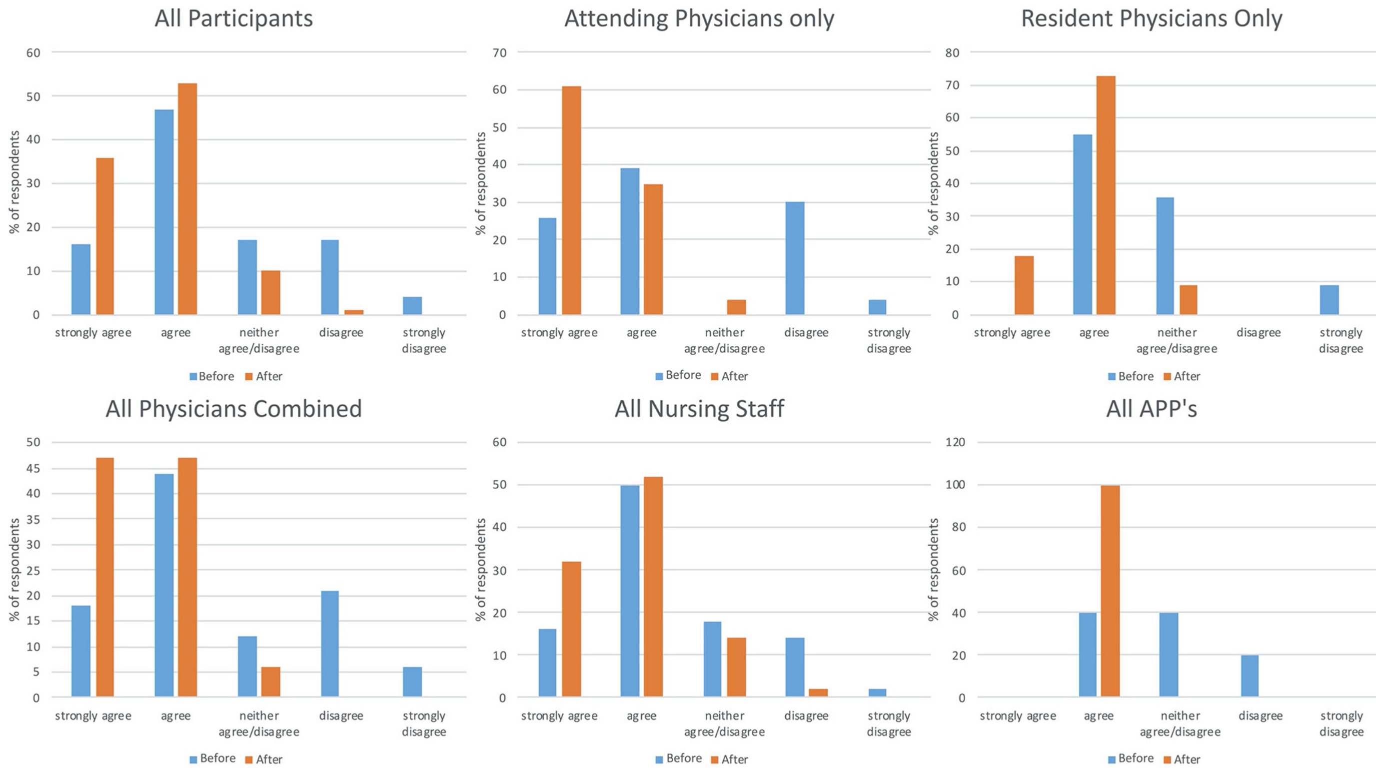

Fig. 2. Provider responses across all subsets of designations showing core knowledge of new model before and after in-situ simulation experience.

4. Discussion

The exact role of nursing personnel alongside physicians as team leaders during a CPA resuscitation is a matter of great clinical equipoise and debate [11-15]. Conventionally, physicians or APP's have held the roles of team leaders. More recently, varying clinical models have led to graduated increases in nursing responsibilities during CPA's [16]. In specific, these models have nursing personnel be completely in-charge of the algorithmic portions of ACLS: CPR quality, timely medication administration and defibrillation. Our study incorporated these aforementioned principles but also advocated for joint physician-nursing leadership in the team via a two-step educational intervention as part of our ED based response to cardiac arrest care during the COVID-19 pandemic. To the best of our knowledge, our study is the first to study the ED based feasibility and efficacy of teaching a tandem physician and nursing leadership model for cardiac arrest care in pandemic settings at an academic medical center.

Our primary objective was to increase overall clinician comfort in the team leader role and increase core knowledge of the new model. To this effect, all clinicians received the same didactic education and in-situ simulation. The goal of this equivalent education was to train and empower all practitioners in the ED setting that may be called upon in a resource-limited environment such as a pandemic. As reported in Figs. 1 & 2, we universally achieved both these goals across all subsets of clinical participants. While all subgroups showed positive quantitative increase, the two subgroups of nursing staff and resident physicians showed the largest statistically significant increase in overall comfort in the role of team leader during a CPA. This result is especially encouraging since both groups represent a cohort with fewer years of clinical experience in comparison to attending physicians and may be the ones deployed or repurposed to other acute settings in a future pandemic. Attending physicians did not show as much of an increase as they are likely already very comfortable leading code teams owing to years of prior experience. Furthermore, the concomitant decrease in discomfort with being a team leader is also an invaluable result, especially with regards to nursing personnel. Their perceived comfort and willingness to accept the role of team leader in a CPA is very promising for pandemic settings where they may be significant physician shortages. APP's did not show a statistically significant increase in either comfort as team leaders or perceived knowledge which is likely due to the low number of APP's in our ED.

Perceived knowledge of the new protocol also improved across all participants because of the intervention. This was a crucial goal of our didactic and simulation-based interventions before this change in practice was incorporated into the care of live patients in cardio-pulmonary arrest. It remains unclear as to whether the didactic or the simulation portion was more effective individually in increasing core knowledge. Anecdotally, the multi-disciplinary in-situ simulations in the emergency department generated robust questions, clarified roles and increased confidence during debriefing sessions. While this would point to a greater impact of the role of simulation over didactics, a direct comparison of one component over the other was not done or feasible in this study design. Future work to individually assess the efficacy of each variable and to observe if these effects are sustained over time is needed. However, it would seem that our two-step intervention was capable of disseminating and increasing perceived knowledge of this new

Table 3
Average provider responses across all subsets of designations showing core knowledge of new model before and after in-situ simulation experience

Participants	Pre-Mean (SD)	Post-Mean (SD)	p-value*
All Participants	3.54 (1.06)	4.24 (0.67)	<0.001
Attending	3.52 (1.31)	4.57 (0.59)	0.001
Resident	3.36 (0.92)	4.09 (0.54)	0.036
All Physicians	3.47 (1.19)	4.41 (0.61)	0.001
Nurses (RN)	3.71 (0.96)	4.17 (0.74)	0.016
Advanced Practice Providers (APP)	3.20 (0.84)	4.00 (0)	0.065

* p-value from Student's TTest.

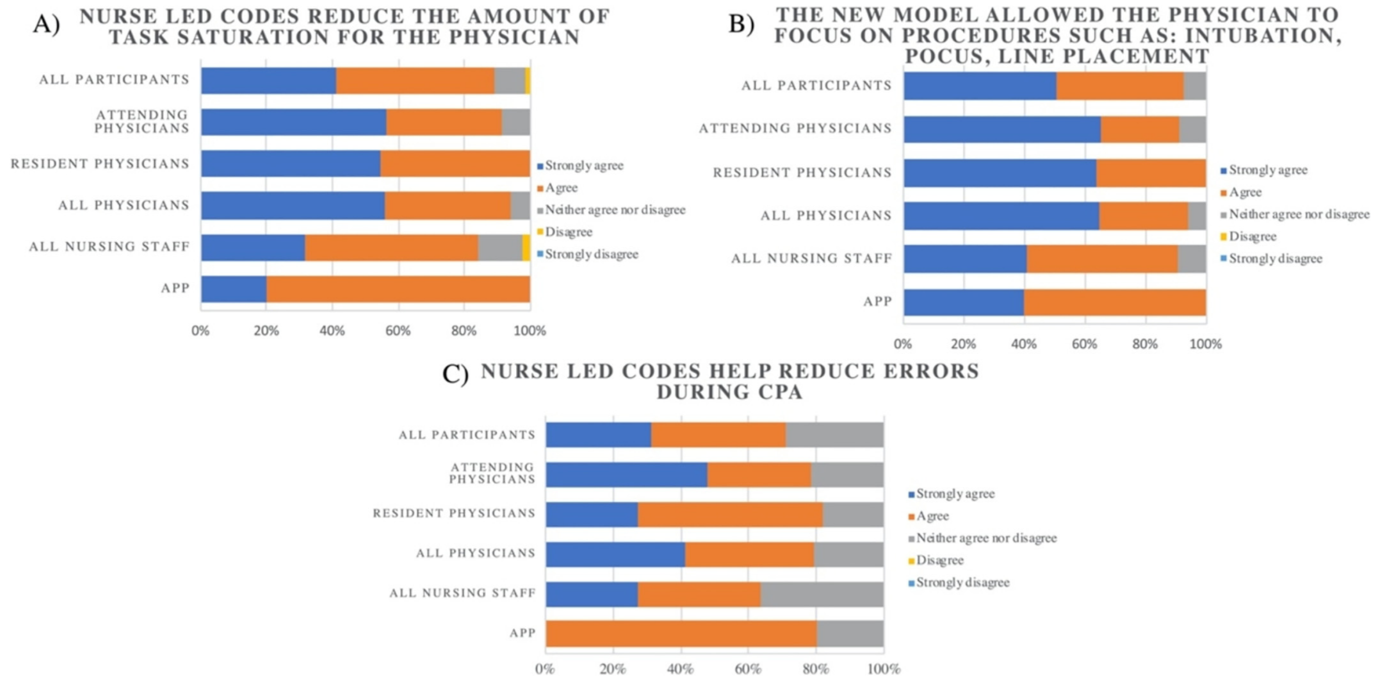

Fig. 3. Bar plots showing responses across varying designations in the emergency department when asked the question of whether nurse led codes reduce the amount of task saturation for the physician (A), responses across varying designations in the emergency department when asked the question of whether the new model allowed the physician to focus on procedures such as: intubation, POCUS, line placement (B), and responses across varying designations in the emergency department when asked the question of whether the new model could help reduce errors during CPA (C).

protocol over all subsets of clinicians in a safe, effective and time efficient manner.

Reduction in task saturation & CPA protocol deviations and increase in safe execution of procedures were also reported by all participants with this new protocol. This is of particular importance in the pandemic setting where routine CPA care is performed with the added challenges of airborne precautions and increased risk to HCW's secondary to numerous AGP's inherent to cardiac arrest care [6,9]. Interestingly, the nursing subgroup felt most indifferent with regards to this new protocol being helpful in reducing task saturations and errors. This may be explained by the comparative lack of nursing experience with procedural and managerial tasks, as well as their associated errors that were conventionally the prerogative of physicians. However, it is reassuring that all our clinicians universally felt that they could effectively delegate core tasks, safely perform AGP's and contribute to an overall reduction in errors. Future work done in real life scenarios should also look to measure these metrics. Within the constructs of a pandemic, it would be crucial to measure unintentional transmission of infection to HCW's and classify errors within the subtypes of errors of commission and/or omission in a cardiac arrest framework.

5. Limitations

This was a single center study with relatively low power that is subject to recall bias. However, this is the largest analysis to date on the topic and the primary intention was to assess clinician comfort and safe, effective dissemination of core knowledge of a new protocol. Due to the high participation and response rate in all clinician subgroups, we believe that the two-step intervention had great penetration within our group. Within our center, a higher power would likely be unachievable as some resident physicians (group with lowest participation) were on clinical rotations outside the ED and/or in quarantine at the time. Given the state of clinical urgency during which the study was conducted, pre-intervention assessments of participants' feelings, such as perceived knowledge and comfort, were not pursued. Further analysis of these perceptions may provide insight into the significance of the intervention's downstream clinical benefits, since participants may not accurately recall their perceptions prior to the intervention. Additionally, this is a simulation-based study and generalizability to real life CPA's is limited. Yet, this pilot investigation was necessary to assess safety and feasibility of this new protocol, especially in a pandemic.

6. Conclusion

A two-step educational intervention that includes didactic education and in-situ simulation is a practical and safe way to disseminate a novel cardiac arrest care protocol in an ED setting during a pandemic. In specific, a tandem physician and nursing led cardiac arrest protocol was teachable and deployable within a very short time period across all clinician subtypes. All participants reported increased clinician comfort in the team leader role and perceived knowledge with this intervention across qualitative and quantitative analyses. Tandem Codes allowed assessments within the domains of task saturation, procedural safety and error prevention in a simulation environment. However, the intervention will need to be further validated in real life cardiac arrest scenarios. Assessments of this protocol in real life CPA care during the COVID-19 pandemic are ongoing and additional data will be analyzed to provide post-clinical implementation assessments, in order to further confirm statistically significant findings from our study. Future studies could assess the clinically translatable benefits of this two-step intervention by measuring the ability of clinicians to delegate core tasks, mitigation of HCW's exposure from AGP's, and reduction of clinical errors during CPA's. This educational and new interventional protocol holds great potential for resource-constrained environments especially during pandemics with great risk to personnel in healthcare.

Authors contribution

Conceptualization: Harman S. Gill, Frank DelGaudio

Data Curation: Harman S. Gill, Frank DelGaudio, Patricia Ruth Atchinson, Matthew Roginski, Evie Marcolini, Kayla Fay

Formal analysis: Harman S. Gill, Phuong Nguyen, Kayla Fay

Investigation: Harman S. Gill, Matthew Roginski, Evie Marcolini, Patricia Ruth Atchinson, Frank DelGaudio
Methodology: Harman S. Gill, Frank DelGaudio
Project Administration: Harman S. Gill, Frank DelGaudio
Resources: Harman S. Gill, Frank DelGaudio, Patricia Ruth Atchinson, Matthew Roginski, Evie Marcolini
Software: Harman S. Gill, Phuong Nguyen, Kayla Fay
Supervision: Harman S. Gill
Validation: Harman S. Gill, Phuong Nguyen, Kayla Fay
Visualization: Harman S. Gill, Phuong Nguyen, Kayla Fay
Writing-original draft: Harman S. Gill, Phuong Nguyen, Kayla Fay
Writing-review & editing: All authors read and approved the final manuscript

Declaration of Competing Interest

None.

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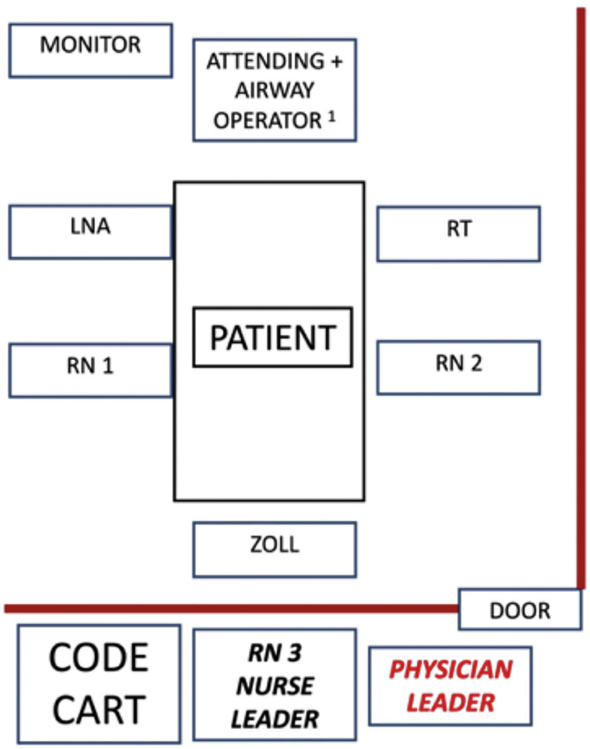
This work was presented at the New England Research Directors (NERDS) committee and the 3rd annual international Red Sea emergency medicine conference

Appendix A. Tandem code protocol

This protocol was disseminated in each room in the emergency department (ED) and to all staff in the ED. Specific placement of each team member, composition of team within and outside the room and specific tasks of each team member are listed.



ROLE	TASKS
ATTENDING	EM Attending of record on case
AIRWAY OPERATOR	• May be EM Attending &/or EM resident • Brings in airway equipment & adjuncts • May also be COVID airway team
LNA	• Grab stool & backboard. Initiate CPR
RN 1	• Bring medication bag: 2 Epi +/- 1x Amio • Assess pt, activate code if in room • Place on NRB & start CPR if in room
RN 2	• Bring Zoll monitor, pads and I-O Kit
RT	• Brings in BVM with viral filiter
RN 3/Nurse Leader	• Runs ACLS algorithm for specific rhythm • Communicates rhythm & pulse check with team in room • Prepares meds for next round if needed
Physician Leader	• Works with Nurse Leader to run code • Ultimate decider of procedures, duration & termination of CPR

If resident intubating, **Attending MUST** be in room
EM Attending decides whether COVID airway team is activated

Appendix B. In-situ simulation process

Over an approximately two-week period, in-situ simulation drills were conducted at random times at the discretion of the ED charge nurse. These were held once each during a 7 am to 7 pm and a 7 pm to 7 am shift in situ in one of the patient care rooms in the ED at our institution. A life-sized mannequin was placed in each of these rooms. The entire team assembled per the configuration and designations defined in appendix above. Emphasis was placed on appropriate donning and doffing procedures per institutional policy in line with national guidelines for those that were entering the room. The arrest rhythm subtype varied between shockable and non-shockable rhythms. An emergency medicine-critical care medicine trained faculty member (not participating in the simulation) would observe the entire session that lasted approximately 20 min. This faculty member then led a comprehensive de-briefing session that involved clarifying features of the protocol and providing feedback on the strengths and weakness of the care team.

Appendix C. Survey questions subsequent to simulation

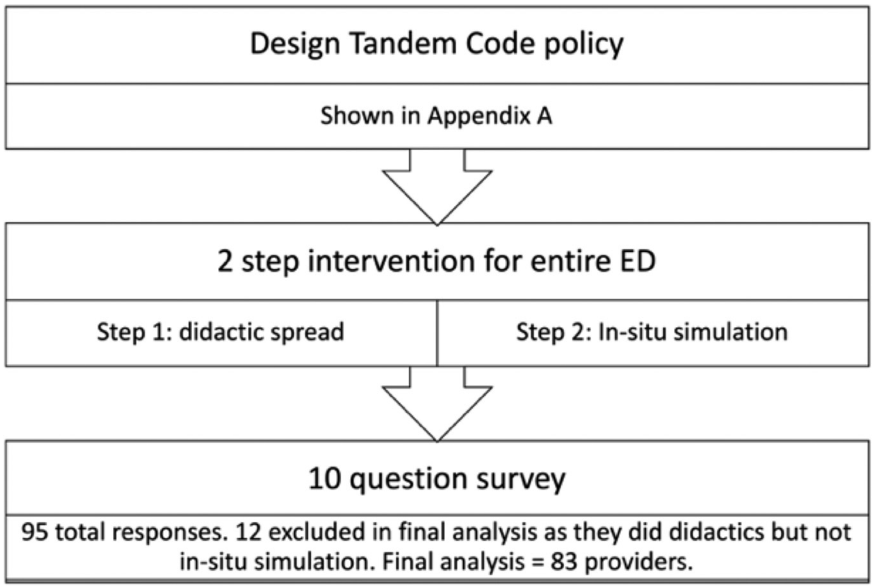
The following ten questions were given to participants in a survey subsequent to the completion of the in-situ simulation:

1. Choose your discipline.
2. How many years of ED experience do you have?
3. Did you participate in a COVID Code Blue simulation?
4. Prior to COVID Code Blue simulation, I felt comfortable functioning as the “team leader” during a cardiopulmonary arrest (CPA).
5. After participating in COVID Code Blue simulation, I feel more comfortable functioning as the “team Leader” during cardiopulmonary arrest.
6. Prior to COVID Code Blue simulation, I had a good understanding of what a “Tandem-led code” is.

7. After COVID Code Blue simulation, I have a good understanding of what a “Tandem-led code” is.
8. Tandem-led codes reduce the amount of task saturation for the physician.
9. Tandem-led codes allow the physician to focus on important procedures such as: intubation, POCUS, line placement.
10. Tandem-led codes can help reduce errors during CPA.

Appendix D. Study flow

The following is a pictographic description of study flow with development of novel protocol, two-step intervention for educational dissemination and then testing tool for determination of effectiveness.



Appendix E. Tabulated values for surveyed responses

Table A.4
Responses across varying designations in the emergency department when asked the question of whether nurse led codes reduce the amount of task saturation for the physician

	All Participants $N = 83$	Attending Physicians $N = 23$	Resident Physicians $N = 11$	All Physicians $N = 34$	All Nursing Staff $N = 44$	Advanced Practice Providers (APP) $N = 5$
Response, n (%)						
Strongly agree	34 (41)	13 (57)	6 (55)	19 (56)	14(32)	1 (20)
Agree	40 (48)	8 (35)	5 (45)	13 (38)	23 (52)	4 (80)
Neither agree nor disagree	8 (10)	2 (9)	0	2 (6)	6 (14)	0
Disagree	1 (1)	0	0	0	1 (2)	0
Strongly disagree	0	0	0	0	0	0

Table A.5
Responses across varying designations in the emergency department when asked the question of whether the new model allowed the physician to focus on procedures such as: intubation, POCUS, line placement

	All Participants N = 83	Attending Physicians N = 23	Resident Physicians N = 11	All Physicians N = 34	All Nursing Staff N = 44	Advanced Practice Providers (APP) N = 5
Response, n (%)						
Strongly agree	42 (51)	15 (65)	7 (64)	22 (65)	18 (41)	2 (40)
Agree	35 (42)	6 (26)	4 (36)	10 (29)	22 (50)	3 (60)
Neither agree nor disagree	6 (7)	2 (9)	0	2 (6)	4 (9)	0
Disagree	0	0	0	0	0	0
Strongly disagree	0	0	0	0	0	0

Table A.6
Responses across varying designations in the emergency department when asked the question of whether the new model could help reduce errors during CPA

	All Participants N = 83	Attending Physicians N = 23	Resident Physicians N = 11	All Physicians N = 34	All Nursing Staff N = 44	Advanced Practice Providers (APP) N = 5
Response, n (%)						
Strongly agree	26 (31)	11 (48)	3 (27)	14 (41)	12 (27)	0
Agree	33 (40)	7 (30)	6 (55)	13 (38)	16 (36)	4 (80)
Neither agree nor disagree	24 (29)	5 (22)	2 (18)	7 (21)	16 (36)	1 (20)
Disagree	0	0	0	0	0	0
Strongly disagree	0	0	0	0	0	0

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