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TAGCARTS

Summary Report: Nursing Perspectives on Code Cart Operation
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RESEARCH PROCESS

Introduction

Karen K. Giuliano, PhD, RN and Jeannine W.C. Blake, MS, BSN, RN conducted an online survey consisting of 25 questions distributed to nurses across care environments.

The overall goal of the survey was to describe code cart utilization and usability from the perspective of experienced acute care nurses. The survey included questions on overall code cart use, code equipment organization and use, power connections and code cart mobilization.

Survey Development

This first draft of the survey was developed by by Karen Giuliano, edits were provided by Jeannine W.C. Bake and Taggart Neal of TAGCarts, and these edits were used to create the final version of the survey for distribution.

Participant Recruitment

Participants were primarily recruited using social media postings and direct messaging targeting practicing nurses. There were a total of 58 respondents, but once respondents who did not meet the recruitment criteria of currently practicing acute care nurse were removed, 41 nurses were included in the final analyses.

RESULTS

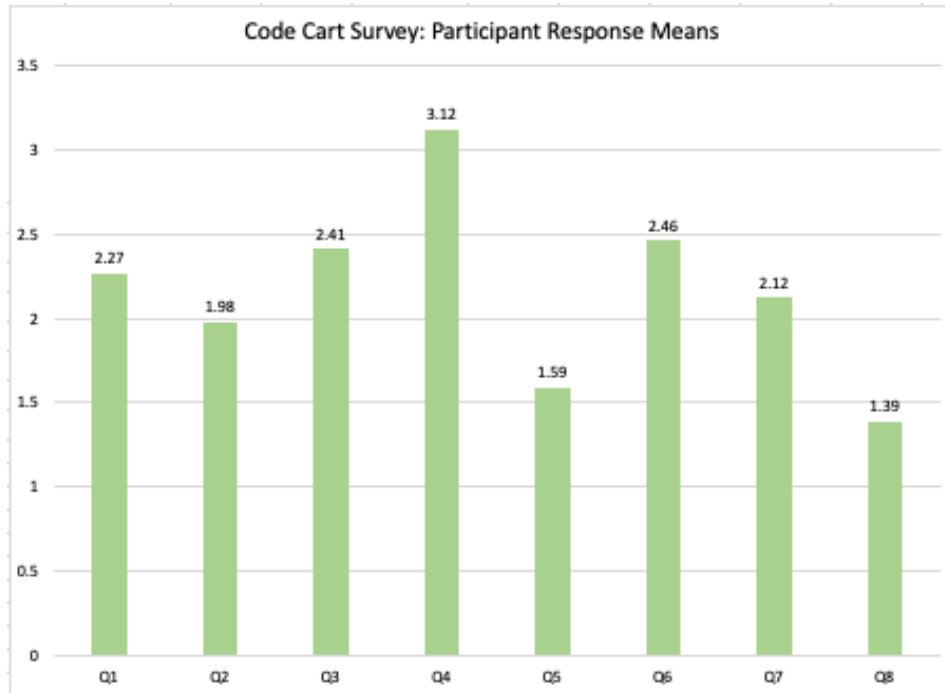## Demographic Data for Nurse Participants (N=41)

Variables (Continuous)	Mean	Range (Low)	Range (High)
Age (years)	33.69	23	66
Nursing experience (years)	8.49	3	35
Number of codes in the last 12 months	15.1	0	100

Variables (Frequency)	N	%
Primary Shift		
Days	30	73.2%
Nights	4	9.8%
Evenings	1	2.4%
Variable	6	14.6%
Travel Nurse		
Yes	3	7.3%
No	41	92.7%
Patient Population		
Adult	40	97.6%
Pediatric	1	2.4%
Clinical Area		
Med-surg	4	9.8%
Critical Care	17	41.5%
Step-down/PCU	8	19.5%
Operating Room	3	7.3%
Emergency Department	3	7.3%
Other	6	14.6%

These demographics highlight that participants were an experienced group of nurses who also had a significant amount of experience with codes each year. The majority of nurses worked with adult populations on day shift in permanent staff positions. The highest percent of respondents worked in critical care followed by step-down/PCU environments. Those who indicated other for their clinical area worked in labor and delivery, cardiac cath lab, PACU (2), radiology and one indicated employment as a CRNA.

RN Perspectives on Code Cart Utilization and Usability

	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Q1: Overall, the equipment on the top of the code cart is well organized and easy to use when providing patient care during a code.	1	2	3	4	5
Q2: The top of the code cart provides a good space to STORE the defibrillator and other equipment so that it is readily available when needed.	1	2	3	4	5
Q3: The top of the code cart provides a good way to SAFELY TRANSPORT the defibrillator and other equipment.	1	2	3	4	5
Q4: The code cart is EASY TO MOBILIZE when I need to use it during a code.	1	2	3	4	5
Q5: The defibrillator and other equipment are always FULLY CHARGED when I need to use it to respond to a code.	1	2	3	4	5
Q6: The code cart is EASY TO UNPLUG when I need to use it to respond to a code.	1	2	3	4	5
Q7: I have to worry about the CORDS DRAGGING when I am mobilizing the code cart.	1	2	3	4	5
Q8: I would like having a secure, quick-release option for the code cart to be disconnected from power that does not require unplugging from the wall outlet.	1	2	3	4	5

Code Cart Survey: Participant Response Means

Question	Mean
Q1	2.27
Q2	1.98
Q3	2.41
Q4	3.12
Q5	1.59
Q6	2.46
Q7	2.12
Q8	1.39

Most of these questions elicited a somewhat neutral response from nurse participants regarding the use of the top of the code cart for storage, transport of equipment, organization and ease of use. Neutral responses were also found when asking about to the ease of unplugging the cart and equipment. Nurses agreed that the defibrillator and other equipment are almost always fully charged when needed. Nurses also expressed agreement that they do worry about cords dragging when mobilizing the cart. One participant even provided a comment that they had once tripped on these cords.

Despite the largely neutral response to these questions, nurses expressed their desire to have a secure and quick release option for the code cart that would allow for disconnection from power without the requirement to unplug power cords from from the wall outlet.

RN Experiences with Current System

Variables (Frequency)	N	%
Which of the following items must be unplugged from the wall outlet before mobilizing the cart to the code (please check all that apply)?		
Defibrillator	40	97.6%
Suction	9	22.0%
Other	2	4.9%
The code carts I am familiar with require the following prior to mobilization		
Unplug 3+ cords from the wall outlet	1	2.4%
Unplug 1 equipment cord or master cord from wall outlet	24	58.5%
Unplug 2 cords from the wall outlet	15	36.6%
No unplugging of cords is required	1	2.4%
Have you ever forgotten to unplug the code cart power cord(s) when responding to a code?		
Yes	12	29.3%
No	29	70.7%
I have personally witnessed equipment falling onto the floor during emergency response to cardiac arrest because it was not unplugged before mobilization.		
Yes	6	14.6%
No	35	85.4%

These results summarize the experience of participants when accessing and mobilizing code carts in the clinical setting. Most indicated that they must unplug a defibrillator while 22% indicated also having to unplug a suction device. The majority (58.5%) use code carts that require one cord to be unplugged from the wall outlet while 36.6% must unplug two cords. Although not the majority, a large number of nurses had experienced an instance in which they forgot to unplug the cart when responding to a code and 14.6% had witnessed equipment falling on the floor due to a failure to unplug equipment.

Text entries from participants provided additional insight into their experiences. Multiple participants described instances in which the defibrillator cord was left plugged into the wall causing damage to the equipment or a near miss but only because it was caught in time. Many

of these participants also indicated time lost due to power management/code care mobility issues.

Time Required to Unplug Cords Prior to Cart Mobilization

Variables (Continuous)	Mean	Range (Low)	Range (High)
Estimated time (seconds) that it takes to unplug and manage the cords in the code cart prior to mobilization.	15.48	2	120

Nurses were asked to estimate the amount of time required to unplug and manage the cords prior to cart mobilization. This is of special importance when responding to codes given that during a code situation time is of utmost importance. The results indicate that on average nurses estimate that it takes approximately 15 seconds to prepare the cart for mobilization.

CONCLUSION

This survey provides data from 41 experienced acute care nurses from different specialty care areas, primarily practicing with an adult patient population. Nurses responded to 25 questions, which provided demographic data for the participant sample along with perspectives and experiential insights regarding their use of code carts.

Points to consider:

- Nurses neither agreed nor disagreed with the statement "the code cart is easy to mobilize when I need to use it during a code" yet also agreed with the statement "I have to worry about the cords dragging when I am mobilizing the code cart". This would indicate that although they don't have strong feelings about the challenge of mobilizing the cart, they do feel they have to worry about the cords.

- The mean time to mobilize a code cart was estimated at just over 15 seconds. This may appear a short amount of time but in the context of cardiac arrest, time is of utmost importance. The American Heart Association recommends the first defibrillatory shock be delivered within 2 minutes.[1] Unfortunately, any delay in time to first defibrillation has been associated signficiantly with decreased survivability.[2] Considering code carts often carry the defibrillator, emergency medications and other essential equipment and supplies, the most important interventions are contingent upon the code cart arriving at the bedside as quickly as possible.

- Many questions pertaining to the way code carts and equipment are currently set up were rated using somewhat neutral responses, indicating a low level of concern from the nurse participants. Despite this, nurses agreed they would like to have a secure, quick-release option for the code cart that does not require unplugging it from the wall outlet. This response suggests that although nurses expressed somewhat minimal concern about the current code cart setup, there is strong interest in an improved design. This may be explained by a behavior seen by health care professionals in which personel who are aware of the existence of a problem do not speak up or when they do are ignored.[3] This is supported by personal experience in which nurses tend to make due with the currently available resources even though they have a desire for the development of improved technology which would better serve their clinical needs and workflows.

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