PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Characterising Variation in Composition and Activation Criteria of Rapid Response and Cardiac Arrest Teams: A Survey of Medicare Participating Hospitals in Five American States
AUTHORS	Mitchell, Oscar; Motschwiller, Caroline; Horowitz, James; Evans, Laura; Mukherjee, Vikramjit

VERSION 1 – REVIEW

REVIEWER	Stolldorf, Deonni Tennessee Valley Healthcare System, GRECC
REVIEW RETURNED	22-Jun-2018

GENERAL COMMENTS	Thank you for submitting the manuscript and for the opportunity to review. This important paper demonstrates variation in practices across hospitals. They reached out to a large group of hospitals. Their response rate is limited but it is not unreasonable in organizational level research. Please find my comments below as ways the paper can be enhanced. Abstract: The study design is not clearly noted. Instead, data collection method is described. The description of participants is repeated in the first line of the results section. I recommend that the authors delete the current "Participant" description and instead describe their population of participants a bit more – did acute care hospitals include community and teaching hospitals, rural/urban/ suburban. Since the authors only focus on CMS participation, it should be clearly stated here. Also, any other eligibility criteria should be noted. Methods: Outcomes: I would recommend that the authors clearly define each of their outcome measures: For example, who did they see as leadership? Was it who at any given RRT call led the RRT effort, was it a formally assigned as leader or someone who informally took leadership during a call? Even though most persons reading this article would not what is meant by activation criteria etc. it is still good practice to clearly define the outcomes so there is no misunderstanding, especially for reproducibility. No data analysis is described in the Methods section. In Table 1- Inpatient beds- should 100-50 be 101- 500 or should 1-100 be 0 – 99? Cannot have 100 in 2 categories. For ACGME- indicate clearly that the results are for ACGME Training program present. Results:

	We don't know if the variation in activation, constitution, and functioning is significant b/c no statistical test was done to determine significance. Thus, I suggest avoiding the use of the word "significant". The authors indicate their study is the first to report variation etc. in RRT and cardiac arrest teams. This may be true for cardiac arrest teams, but not for RRTs. See Stolldorf DP, Jones CB. Deployment of rapid response teams by 31 hospitals in a statewide collaborative. Jt Comm J Qual Patient Saf. Apr 2015;41(4):186-191. The paper could be strengthened by doing some statistics beyond descriptive statistics by comparing hospitals by activation criteria, etc. The authors could compare by size, location, type, for example. Variation in leadership may be a factor of if a hospital is a teaching hospital vs. not, if they employ NPs or PA's or not. As I read the paper, I was particularly wondering if variation existed between hospitals w/ and w/o EWS in place and if it would be statistically significant or not. I also wondered if hospitals were asked if they had a dedicated RRT as some hospitals do use this type of structure. Also, I wondered if the staffing of the RRT is made up of the same individuals who respond to cardiac arrests or if they are treated in hospitals as 2 separate teams. Discussion The discussion is appropriate for the work done. If the authors consider adding to their analysis by doing some comparisons between sites, I believe the robustness of the discussion can be enhanced. I would like to see included in this section a discussion of future research and what types of studies the authors believe would be beneficial. References As for references, many are more than 10 years old. However, some are important papers to site- Like Bellomo 2003 and DeVita 2004. I suggest the authors consider updating the 2001 paper on EWS.

REVIEWER	Michael Xu McMaster University, Canada
REVIEW RETURNED	26-Jun-2018

GENERAL COMMENTS	Thank you to the authors for addressing a field which is sorely in need of further research. I agree that much emphasis has been placed upon evaluating the presence of a rapid response team, with little on the implementation process. This paper is a good first start potentially, however it is unclear as to what the survey asked without a copy of it. The methodology reported is sparse, and could be expanded upon, please refer to the STROBE checklist as an area to start. Thank you for your contributions.

VERSION 1 – AUTHOR RESPONSE

Reviewer: 1
Reviewer Name: Dr. D Stolldorf

Institution and Country: Vanderbilt University School of Nursing, USA. Content is own work. The views and opinions expressed here are not necessarily those of Vanderbilt University and they may not be used for advertising or product endorsement purposes.
Please state any competing interests or state 'None declared': None.

Thank you for submitting the manuscript and for the opportunity to review. This important paper demonstrates variation in practices across hospitals. They reached out to a large group of hospitals. Their response rate is limited but it is not unreasonable in organizational level research. Please find my comments below as ways the paper can be enhanced.

Abstract:
The study design is not clearly noted. Instead, data collection method is described.
The description of participants is repeated in the first line of the results section. I recommend that the authors delete the current "Participant" description and instead describe their population of participants a bit more – did acute care hospitals include community and teaching hospitals, rural/urban/ suburban. Since the authors only focus on CMS participation, it should be clearly stated here. Also, any other eligibility criteria should be noted.

These changes have been made as recommended and indicated with the "Track Changes" function.

Methods:
Outcomes: I would recommend that the authors clearly define each of their outcome measures: For example, who did they see as leadership? Was it who at any given RRT call led the RRT effort, was it a formally assigned as leader or someone who informally took leadership during a call? Even though most persons reading this article would not what is meant by activation criteria etc. it is still good practice to clearly define the outcomes so there is no misunderstanding, especially for reproducibility.

These comments have been incorporated into the manuscript and indicated with the "Track Changes" function.

No data analysis is described in the Methods section.

Data analysis has been performed and incorporated into the manuscript. Methodology has been included on page 6, and statistical information has been included on page 9-10 in the results section.

In Table 1- Inpatient beds- should 100-50 be 101- 500 or should 1-100 be 0 – 99? Cannot have 100 in 2 categories. For ACGME- indicate clearly that the results are for ACGME Training program present.

This is absolutely correct. To rectify this issue, we have combined the two categories into 0-500. This has been reflected in Table 1. These changes have been made as recommended and indicated with the "Track Changes" function.

Results:
We don't know if the variation in activation, constitution, and functioning is significant b/c no statistical test was done to determine significance. Thus, I suggest avoiding the use of the word "significant".
The authors indicate their study is the first to report variation etc. in RRT and cardiac arrest teams. This may be true for cardiac arrest teams, but not for RRTs. See Stolldorf DP, Jones CB. Deployment of rapid response teams by 31 hospitals in a statewide collaborative. Jt Comm J Qual Patient Saf. Apr 2015;41(4):186-191.

These changes have been made as recommended and indicated with the "Track Changes" function. In addition, this reference has been added to the article.

The paper could be strengthened by doing some statistics beyond descriptive statistics by comparing hospitals by activation criteria, etc. The authors could compare by size, location, type, for example. Variation in leadership may be a factor of if a hospital is a teaching hospital vs. not, if they employ NPs or PA's or not. As I read the paper, I was particularly wondering if variation existed between hospitals w/ and w/o EWS in place and if it would be statistically significant or not.

Data analysis has been performed and incorporated into the manuscript. Methodology has been included on page 6, and statistical information has been included on page 9-10 in the results section. This includes whether the use of EWS is correlated to hospital size and whether hospital size or ACGME status impacts on team structure.

I also wondered if hospitals were asked if they had a dedicated RRT as some hospitals do use this type of structure. Also, I wondered if the staffing of the RRT is made up of the same individuals who respond to cardiac arrests or if they are treated in hospitals as 2 separate teams.

Unfortunately we did not ask whether the hospital considered the two teams as separate, so we were unable to incorporate this change into the manuscript.

Discussion
The discussion is appropriate for the work done. If the authors consider adding to their analysis by doing some comparisons between sites, I believe the robustness of the discussion can be enhanced. I would like to see included in this section a discussion of future research and what types of studies the authors believe would be beneficial.

An expanded discussion has been added which considers the analysis between sites as discussed above. In addition, a section on areas of further study has been added on page 15.

References
As for references, many are more than 10 years old. However, some are important papers to site- Like Bellomo 2003 and DeVita 2004. I suggest the authors consider updating the 2001 paper on EWS.

This older reference has been updated.

Reviewer: 2
Reviewer Name: Michael Xu
Institution and Country: McMaster University, Canada
Please state any competing interests or state 'None declared': None declared

Thank you to the authors for addressing a field which is sorely in need of further research. I agree that much emphasis has been placed upon evaluating the presence of a rapid response team, with little on the implementation process. This paper is a good first start potentially, however it is unclear as to what the survey asked without a copy of it. The methodology reported is sparse, and could be expanded upon, please refer to the STROBE checklist as an area to start.
Thank you for your contributions.

A copy of the survey will be submitted as Appendix 1. We agree that the inclusion of the survey will add clarity to the overall manuscript.
A STROBE checklist will also be uploaded and the methods section has been further expanded to clarify how the study was conducted.

VERSION 2 – REVIEW

REVIEWER	Deonni Stolldorf Vanderbilt University School of Nursing
REVIEW RETURNED	17-Dec-2018

GENERAL COMMENTS	Thank you to the co-authors for addressing reviewer comments and updating the manuscript to reflect these updates. It is appreciated. A few minor edits: Methods section: Survey design: I appreciate the full description of the survey design. The authors mention in their stated hypothesis earlier the variables "team structure, leadership, and activation criteria". Clarify if team structure = RRT characteristics as the term "team structure" is not at all referred to in the methods section- what data were collected to assess team structure? Some type of statement to let the reader know how defined/ assess team structure would be good. If RRT team structure = RRT characteristics, state this clearly. Use terms consistently throughout and if you are interchanging terms, let the audience know this. Statistics review: I would like to see the authors indicate that they did both descriptive statistics and Chi Square Test analyses and the statistical package they used (assuming SPSS) to evaluate the data. They never state what they did to derive at their results for the descriptions of the characteristics of the hospital, teams etc. I appreciate the additional statistical analyses that were done. Under "membership turnover", please list the p-value for the not significant finding of hosp size, ICU size and association with EWS. (like you did for RRT composition section)

VERSION 2 – AUTHOR RESPONSE

Reviewer(s)' Comments to Author:

Reviewer: 1
Reviewer Name: Deonni Stolldorf
Institution and Country: Vanderbilt University School of Nursing
Please state any competing interests or state ‘None declared’: None declared.

Please leave your comments for the authors below
Thank you to the co-authors for addressing reviewer comments and updating the manuscript to reflect these updates. It is appreciated.

A few minor edits:
Methods section:
Survey design: I appreciate the full description of the survey design. The authors mention in their stated hypothesis earlier the variables "team structure, leadership, and activation criteria". Clarify if team structure = RRT characteristics as the term "team structure" is not at all referred to in the methods section- what data were collected to assess team structure? Some type of statement to let

the reader know how defined/ assess team structure would be good. If RRT team structure = RRT characteristics, state this clearly. Use terms consistently throughout and if you are interchanging terms, let the audience know this.

The word structure has been changed (to composition for the majority of cases) for greater clarity.

Statistics review: I would like to see the authors indicate that they did both descriptive statistics and Chi Square Test analyses and the statistical package they used (assuming SPSS) to evaluate the data. They never state what they did to derive at their results for the descriptions of the characteristics of the hospital, teams etc.

This was already described in the methods section on page 6.

I appreciate the additional statistical analyses that were done. Under "membership turnover", please list the p-value for the not significant finding of hosp size, ICU size and association with EWS. (like you did for RRT composition section)

This has been added to page 9.

We have also added one reference – listed as number 14 – Edelson et al.