



The University of Northern Colorado

School of Nursing



Cardiac Arrest Following Sternotomy – Changing the Norm

Brandi Peroney, BSN-RN, CCRN, MS-AGACNP Student

ABSTRACT

Controversy exists regarding the use of CPR in the post-operative cardiac surgery patient due to the risk of serious complications to the heart structure, even death.

Internal compressions and direct cardiac massage have been studied as an alternative to traditional closed-chest CPR in this patient population.

PURPOSE/BACKGROUND

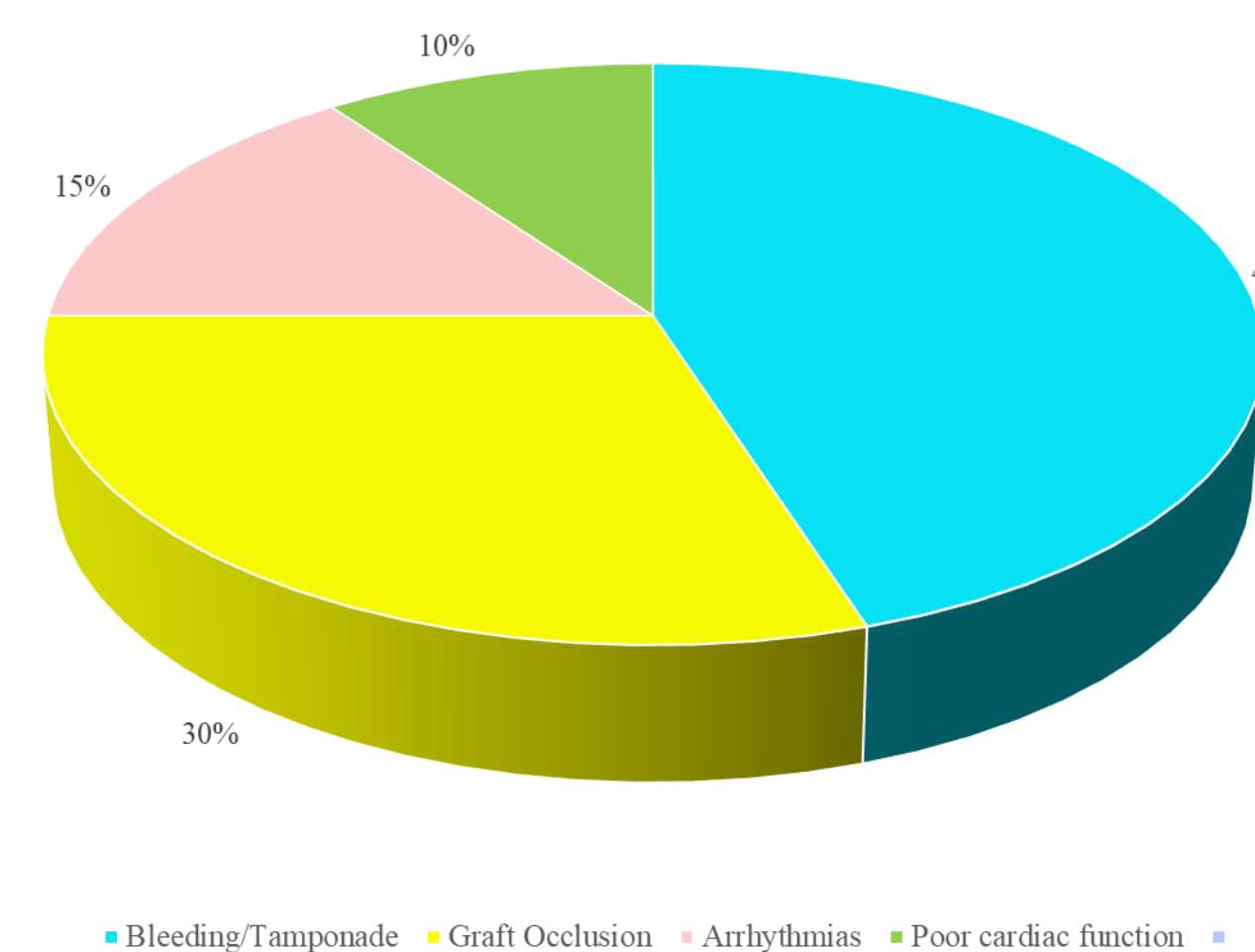
This presentation reviews the research to consider the impact of internal cardiac massage on mortality and the implications for practice. These considerations have posed the following PICO question:

In adult patients recovering from sternotomy requiring cardiopulmonary resuscitation (P), how does the use of cardiac massage (I) compared with standard external compressions (C) affect mortality rates (O)?

METHODS

An exhaustive search on Summon, Medline, UpToDate, and CINAHL. Search terms included sternotomy, cardiac arrest, re-sternotomy, internal cardiac massage, open-chest CPR, care of post-operative cardiac surgery. Time frames were limited to 2002-2017. In total, 103 abstracts were reviewed, and 10 articles selected according to relevancy to PICO question.

ANALYSIS



Reversible causes of arrest are reviewed. Majority of reversible causes require investigation directly at the source during re-sternotomy. In a study assessing survival rates in open-chest internal cardiac massage the causes were as follows (1)(2):

RESULTS

Majority of studies reviewed support the use of early defibrillation and internal cardiac massage over external compressions. Outcomes include increased coronary perfusion pressures, increased cerebral perfusion pressures, and early identification of cause of arrest (3).

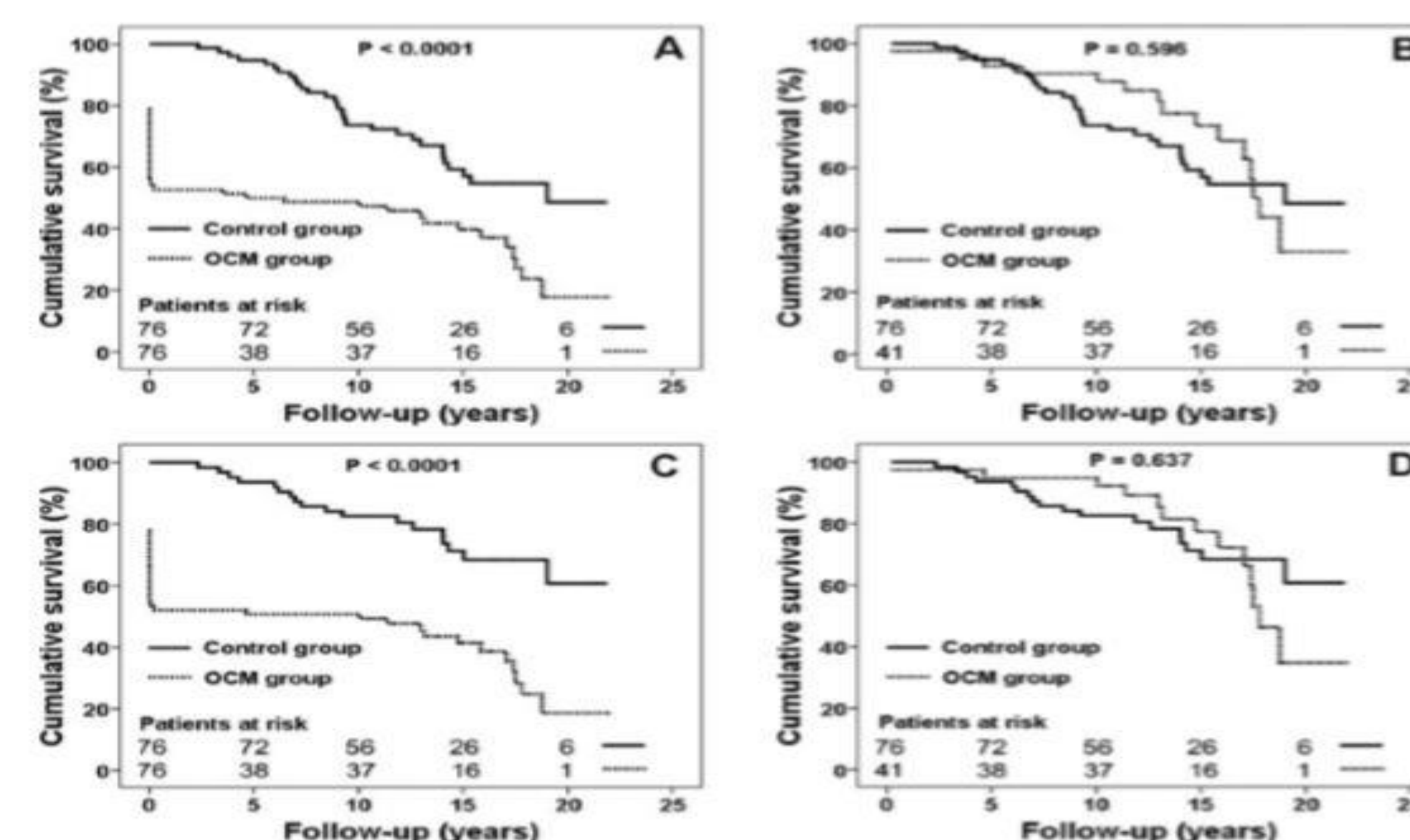
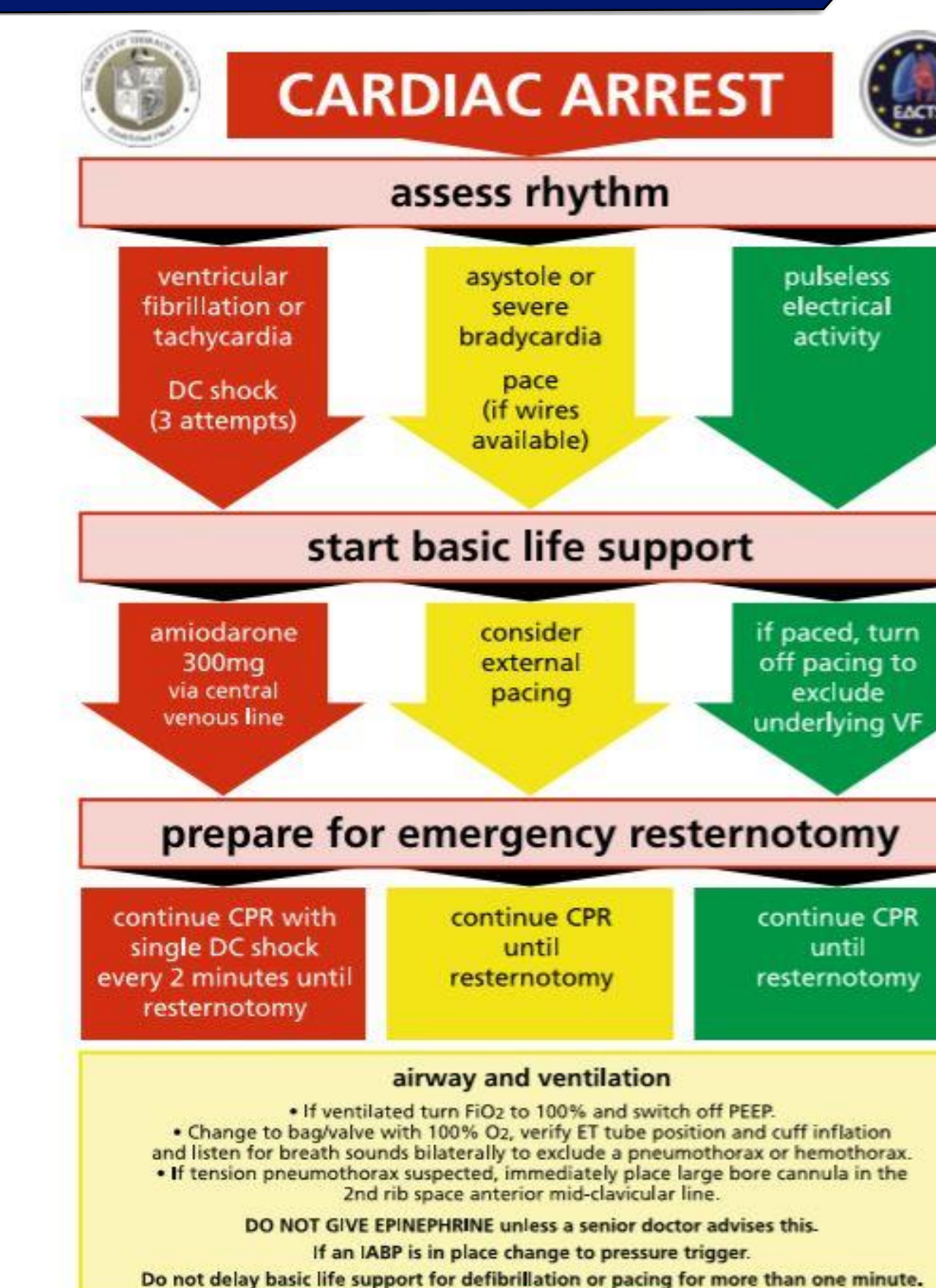


Fig. 1. (A) Overall survival of the open cardiac massage (OCM) and Control groups. (B) Adjusted survival of the OCM and Control groups (deaths within 30 days of operation are excluded). (C) Overall cardiac survival of the OCM and Control groups (all non-cardiac causes of death are excluded). (D) Adjusted cardiac survival of the OCM and Control groups (all non-cardiac causes of death and deaths within 30 days of operation are excluded).

CONCLUSIONS

Evidence supports the initiation of early defibrillation, re-do sternotomy, and internal cardiac massage in most patients recovering from cardiac surgery (3). Implications to practice and recommendations are provided for the three-shock, open chest, internal massage protocol (3).



REFERENCES

- Pottle et al. *Resuscitation*. 2002, 52, 269-272.
- Cowen and Ngaage. *Annals of Thoracic Surgery*. 2009, 88, 64-68.
- Karhunen et al. *European Journal of Cardio-Thoracic Surgery*. 2011, 40, 249-254.
- Dunning et al. *Annals of Thoracic Surgery*. 2017, 103, 1005-1020.

ACKNOWLEDGEMENTS

A special thank you to my Program Director and Oral Comprehensive Chairperson Marcia Patterson, DNP, NP-C, GNP-BC for her endless support throughout this project.