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Pieter F Fouche
Paramedics Australasia
Monash University

Kristina M Zverinova
Paramedics Australasia

Review

The Australian Resuscitation Council Guideline for Managing Acute Dysrhythmias: An appraisal

Pieter F Fouche MScMed (ClinEpi), BHSc[1,2], Kristina M Zverinova RN, MIPH, BN, BA[1]

Affiliation:
[1]Paramedics Australasia
[2]Department of Community Emergency Health and Paramedic Practice, Monash University, Victoria

Abstract

Introduction
Arrhythmias are a significant health burden in Australia, responsible for about 1% of deaths annually. The Australian Resuscitation Council (ARC) 'Guideline 11.9: Managing Acute Dysrhythmias' was designed to guide doctors, paramedics and nurses in the emergency management of arrhythmias. It is important to have high quality clinical practice guidelines to aid the treatment of these arrhythmias. The aim of this study was to assess the quality of Guideline 11.9.

Methods
The Appraisal of Guidelines for Research and Evaluation (AGREE) instrument is widely used to assess clinical practice guidelines for quality. Two raters assessed the six domains of quality of the guideline using the AGREE II tool. The inter-rater agreement between the raters was measured with the intraclass correlation coefficient.

Results
Inter-rater agreement was good at 0.73 (95% CI: 0.45–0.88). Both raters assigned the guideline a score of three, for a combined score of three out of a possible seven on the AGREE II rating scale.

Conclusion
The use of the ARC Guideline 11.9: Managing Acute Dysrhythmias is not recommended based on the authors' assessment using the AGREE II tool. Emergency departments and pre-hospital systems should consider looking elsewhere for a higher quality guideline.

Keywords
arrhythmia; dysrhythmia; guideline; prehospital; Australian Resuscitation Council

Corresponding Author: Pieter F Fouche, pfouche@ambulance.nsw.gov.au

Introduction

The Australian Resuscitation Council (ARC) is a voluntary organisation formed to coordinate the 'uniformity and standardisation of resuscitation techniques' (1). It also produces guidelines pertaining to the teaching and practise of resuscitation, which are intended for clinicians and practitioners involved in the provision of resuscitation measures (2), including first aiders, paramedics, nurses and doctors. The ARC has developed a clinical practice guideline for the management of patients with cardiac dysrhythmias – Guideline 11.9: Managing Acute Dysrhythmias (3).

The term 'cardiac dysrhythmia' or 'arrhythmia' is defined as 'a rhythm other than a normal sinus rhythm when … the heart rate is less than 60 or greater than 100 beats per minute, … the rhythm is irregular, … premature contractions occur, … or the normal progression of the electrical impulse through the electrical conduction system is blocked' (4). The clinical significance of cardiac dysrhythmias pertains to the heart's inability to maintain sufficient cardiac output and perfusion of the body, in particular the vital organs. The clinical manifestation of cardiac dysrhythmias can range from decreased peripheral perfusion to decreased central perfusion, causing altered levels of consciousness, dyspnoea, chest pain and palpitations, which may eventually progress to cardiac arrest (4).

Data on cardiac arrhythmias in Australia is limited, and there is no national data specifically on the incidence and prevalence, burden of disease, health expenditure and economic costs. In terms of mortality, based on data from the Australian Bureau of Statistics, despite a general decline in the proportion of Australian deaths attributed to circulatory diseases from 38% in 2001 (5) to 31% in 2011 (6), the proportion of Australians dying from cardiac arrhythmias could be on the rise, from 0.76% of deaths in 2001 (7) to 1% in 2011 (8). According to the Australian Institute of Health and Welfare, the rate of prescription of anti-arrhythmic medication has risen between 2006 and 2008, from 0.6 to 1.9 doses per 1000 population per day (9). It follows that cardiac arrhythmias represent a significant health burden in Australia, thus making clinical practice guidelines for the treatment of arrhythmias of critical importance.

Adherence to cardiac guidelines in the pre-hospital setting was found to be poor in a study by Ebben et al (10). As ARC guidelines are produced for use by ambulance services, emergency departments and others, it would seem sensible to critically evaluate them and Guideline 11.9 was selected. Clinical practice guidelines are a series of statements designed to provide a 'considered, unbiased, evidence-based, accessible, transparent and easy-to-use summary of the implications of current health knowledge for practice, which, if used, should improve the quality of care' (11), and are often seen by many clinicians as an evidence-based definitive guide to clinical practice (12). As the ARC Guideline 11.9 seeks to guide clinical practice related to the management of cardiac arrhythmias in the emergency and acute care setting, it was selected for critical evaluation by the current study.

The aim of this study was to appraise the quality of the Guideline 11.9.

Methods

Guideline 11.9 was assessed using the Appraisal of Guidelines for Research and Evaluation instrument, version 2 (AGREE II) (13). The AGREE II instrument was developed to address issues to do with the variation of methodological quality and development transparency of clinical practice guidelines, with at least 139 publications citing the instrument (14).

The AGREE II assesses six domains and 23 items of a clinical practice guideline (Table 1), using a rating scale of one to seven (strongly disagree to strongly agree):

1. Scope and purpose
2. Stakeholder involvement
3. Rigour of development
4. Clarity of presentation
5. Applicability
6. Editorial independence.

Items 7, 8 and 9 from domain three 'Rigour of development' pertaining to the search, selection and evaluation of evidence for treatment recommendations were left out of this analysis. The guideline utilises treatment recommendations of the International Liaison Committee on Resuscitation (ILCOR), which already searched, selected and evaluated the strengths and limitations of the evidence very thoroughly (15). As the mission of ILCOR is to create treatment recommendations from which the ARC and other organisations derive their guidelines, it seemed counterproductive to negatively rate the ARC guidelines for not completing a search and evaluation of evidence. Dropping specific items from the six domains that are not deemed necessary is in keeping with the AGREE II recommendations (13). The scores for each of the six independent domains are then used to derive a final overall assessment of the quality of the particular clinical guideline, which can range from one, which is the lowest possible quality, to seven, which is the highest.

Two raters assessed Guideline 11.9 independently (PF and KZ) using the AGREE II tool. The intra-class correlation coefficient (ICC 2, 1) was calculated as described by Shrout and Fleiss (16) to test for the inter-rater agreement, using Stata version 12 (StataCorp, College Station, Texas). The final combined rating of the arrhythmia guideline was achieved by consensus.

Results

The results found a good inter-rater agreement of 0.73 (95% CI: 0.45-0.88, p<0.001). Table 1 lists the scores for each item by the two raters. The guideline scored reasonably high for domain three (rigour of development) and domain four (clarity of presentation). However, the guideline scored poorly in domain five (applicability) and domain six (editorial independence). The guideline fared moderately for domain one (scope and purpose) and for domain two (stakeholder involvement).

Rater PF gave an overall score of three out of a possible seven, and did not recommend the use of this clinical guideline to guide practice and treatment decisions. Rater KZ gave a score of three out of seven, and did not recommend its use. A combined score of three out of seven was assigned for this guideline. By consensus of the raters, the use of this guideline (as currently presented) is not recommended due to the very low ratings of domains five and six.

All items were rated very similar by the two raters, except for item six, which dealt with the definition of the target users of the guideline. This discrepancy can be explained by a difference in understanding of ARC Guideline 1.4, which states the ARC guidelines 'shall be resource documents for individuals and organisations that teach and practise resuscitation' (2). The issues associated with a poorly identified, and perhaps too broad a group of target end users, is discussed further below.

Discussion

This study investigated the quality of the ARC Managing Acute Dysrhythmias clinical practice guideline using the AGREE II instrument. It found very significant shortcomings in the quality of the guideline. A combined score of three out of a possible seven reveals that Guideline 11.9 could be considered poor in its methodological quality, and therefore the raters do not recommend its use to guide clinical practice.

Assessing for the presence of various challenging factors and barriers to implementation of interventions and guidelines in clinical practice can improve health care outcomes (17). Guideline 11.9 did not consider the potential barriers to its implementation experienced by the various end users such as emergency department doctors and nurses, and paramedics in Australian ambulance services. The resource implications of this guideline are not discussed in any depth. The lack of discussion of resource implication is important, as physical resources, funding and time can be substantial barriers to guideline implementation (18,19). Apart from the algorithms in the guideline aimed at guiding treatment decisions, no further tools (such as manuals and other media) or solutions to barrier analysis are provided that will help put the recommendations into practice. At different points in time a clinician's practice can be affected by specific barriers related to the clinician or their setting, which can be identified using barrier analysis strategies and addressed to improve health care outcomes (19). Furthermore, there is no strategy in Guideline 11.9 for the evaluation or auditing of the guideline in terms of its quality, implementation, adherence to recommendations, or impact. No process, clinical or health outcome measures for monitoring and auditing of the guideline use are specified. This lack of evaluation process can impact the accuracy of clinical governance during review of guideline recommendations (20).

It is known that competing interest of the experts making the recommendations can impact on a clinician's trust in a guideline (21). Assessment of the editorial independence provides a way to measure such conflicts of interest, an area in which the evaluated clinical guideline fares very poorly. Guideline 11.9 does not contain the source of funding (or an explicit statement of no funding) specific to the guideline. Nor does it contain a statement denying the influence of the funding on the content of the guideline. The ARC homepage contains an overall statement of the ARC being 'sponsored by the Royal Australasian College of Surgeons and the Australian and New Zealand College of Anaesthetists' (22). Both of these have representatives on the ARC council (23), however, it is unknown if they were involved in the steering committee who developed this guideline. Furthermore, the guideline development group do not disclose any potential competing interests. Although a list of names of ARC representatives is available on the ARC website (23), no information is available as to which members were specifically involved in the development of Guideline 11.9. There is no statement found describing the methods by which potential competing interests were addressed, nor is there a statement describing the presence or absence of competing interests of the guideline development group.

The identification of the scope and purpose of Guideline 11.9 is poor. The general aims and objectives of the ARC are described in Guideline 1.1 (1). The specific aims and objectives in terms of the intent, benefit/outcome and targets specific to Guideline 11.9 are not identified. The general introduction/discussion in the first few paragraphs alludes more to the importance of treating dysrhythmias, rather than clearly describing the objectives or expected health benefits specific to the treatment of dysrhythmias. Although interventions are discussed (pharmacological, electrical, physical), there is no differentiation of the site or setting where these are to be utilised and their associated setting-specific challenges (16,17). The guideline did not differentiate between settings such as out-of-hospital (ambulance) versus hospital acute (emergency), intensive care unit or coronary care unit. Some description of the target population in terms of the presence/absence of specific signs and symptoms is presented, with no differentiation within the target population in terms of gender, age (elderly or adult versus paediatric), comorbidities or exclusion criteria, all of which can bring their own variables and further influence clinical decisions and practice (21,24,25).

Domain	Item	Domain (%)	Rater (KZ)	Rater (PF)
1. Scope and purpose	1. The overall objective(s) of the guideline is (are) specifically described	31	3	1
	2. The health question(s) covered by the guideline is (are) specifically described		4	2
	3. The population (patients, public, etc.) to whom the guideline is meant to apply is specifically described		4	3
2. Stakeholder involvement	4. The guideline development group includes individuals from all relevant professional groups	25	3	1
	5. The views and preferences of the target population (patients, public) have been sought		2	2
	6. The target users of the guideline are clearly defined		6	1
3. Rigor of development	7. Systematic methods were used to search for evidence	57	Not appraised	
	8. The criteria for selecting the evidence are clearly described		Not appraised	
	9. The strengths and limitations of the body of evidence are clearly		Not appraised	
	10. The methods for formulating the recommendations are clearly described		6	7
	11. The health benefits, side effects and risks have been considered in formulating the recommendations		2	3
	12. There is an explicit link between the recommendations and the supporting evidence		6	6
	13. The guideline has been externally reviewed by experts prior to its publication		1	1
	14. A procedure for updating the guideline is provided		7	5
4. Clarity of presentation	15. The recommendations are specific and unambiguous	75	5	5
	16. The different options for management of the condition or health issue are clearly presented		5	6
	17. Key recommendations are easily identifiable		5	7
5. Applicability	18. The guideline describes facilitators and barriers to its application	4	1	1
	19. The guideline provides advice and/or tools on how the recommendations can be put into practice		2	1
	20. The potential resource implications of applying the recommendations have been considered		1	2
	21. The guideline presents monitoring and/or auditing criteria		1	1
6. Editorial independence	22. The views of the funding body have not influenced the content of the guideline	0	1	1
	23. Competing interests of guideline development group members have been recorded and addressed		1	1

Table 1. Rating scores for the ARC Management of Acute Dysrhythmias guideline

As discussed, there is no explicit information regarding the members of the guideline development group. This is of further importance in considering stakeholder involvement, as it is unclear if all relevant professional groups and intended users of the guideline were actually consulted in the development process. There is no evidence of target population involvement/consultation, nor a description of the views and preferences of the target population regarding the treatment of dysrhythmias. All of these ambiguities in the development process can negatively influence the applicability of a guideline and the clinician's choice to utilise it (21).

Guideline 11.9 is based on ILCOR guidelines, which are derived from a thorough and systematic review of the relevant literature (26). It is considered a strength of Guideline 11.9 that the ARC derived their recommendations from ILCOR recommendations. However, it is problematic that Guideline 11.9 was last updated in 2009, despite the latest ILCOR recommendations being published in 2010 (26), with a further review expected in 2015 (27). Of note is that the American Heart Association promptly incorporated the 2010 ILCOR recommendations in to their guidelines (28). As guidelines are outdated, on average, within 5.8 years of being produced (29), it would seem prudent for the ARC to consider updating their guidelines more frequently, perhaps 5-yearly, and schedule these reviews so that they coincide with the release of ILCOR recommendations.

Limitations of this study

The AGREE II tool makes no specific recommendations as to the composition of the assessment team, and only requires that at least two people rate a guideline. As Guideline 11.9 was rated by two people, the assessment is therefore valid and conforms to the recommendations of the AGREE consortium. However, it would have been ideal to have at least four raters, which is the optimal number recommended by the AGREE II instrument (2). Also, both reviewers in this study are from the same clinical background (paramedics). Replicating the current study using a rating team composed of clinicians and target users from a more diverse background might be a direction to consider for future research on this topic.

Conclusion

Using the AGREE II tool for assessment, we found that ARC Guideline 11.9: Managing Acute Dysrhythmias has considerable shortcomings, especially in terms of applicability and editorial independence. Its strength is that it is derived from ILCOR guidelines, however, we recommend that emergency departments and out-of-hospital emergency care providers consider using clinical practice guidelines developed by the American Heart Association (28) or the European Resuscitation Council (30), as these guidelines reflect the most up-to-date ILCOR recommendations (15). We also recommend that our assessment of Guideline 11.9 be repeated by a larger multidisciplinary team, and that other ARC guidelines be assessed in a similar fashion.

Competing interests

The authors declare they have no competing interests. Each author has completed the ICMJE conflict of interest statement.

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