Australian ARF & RHD Guideline: Development and Implementation Framework

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MAY 2025

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Introduction

Evidence-based clinical practice guidelines are important for acute rheumatic fever (ARF) and rheumatic heart disease (RHD); ARF is difficult to diagnose, these conditions are not common beyond the First Nations population, and RHD can have severe consequences for the people affected.

The Australian guideline for the prevention, diagnosis and management of acute rheumatic fever and rheumatic heart disease (3rd edition) is produced and published by Menzies School of Health Research. It includes standards, recommendations and guidance for disease prevention and clinical management within the Australian context.

The Guideline:

- Is informed by end-user feedback.
- Is developed in accordance with the NHMRC Standards for Guidelines.
- Is developed in collaboration with a First Nations advisory group and other key stakeholders.
- Draws on the latest international, national and local evidence.
- Promotes culturally safe clinical care for First Nations peoples.

This document includes a compliance statement for guideline development in line with NHMRC standards and an implementation framework. The costs and workforce capacity required for production, dissemination and implementation of the Guideline are not discussed.

Acronyms and Abbreviations

AIHW	Australian Institute of Health and Welfare
ARF	Acute rheumatic fever
BPG	Benzathine benzylpenicillin G
CARPA (HCM)	Central Australia Rural Practitioners Association (Health Care Manuals)
CHIS	Community Health Information System
CRANA	Council of Remote Area Nurses of Australia Inc
GRADE	Grading of Recommendations, Assessment, Development and Evaluations
KAMSC	Kimberley Aboriginal Medical Services Council
NHMRC	National Health and Medical Research Council
PCCM	Primary Clinical Care Manual
PCIS	Primary Care Information System
PHN	Primary Health Network
RHD	Rheumatic Heart Disease
RPHCM	Remote Primary Health Care Manuals
Strep A	Group A streptococcus
THOM	Tropical Health Orientation Manual
WBM	Women's Business Manual
WHF	World Heart Federation
WHO	World Health Organisation

NHMRC Standards for Guideline Development: Statement

STANDARD 1 - BE RELEVANT AND USEFUL FOR DECISION MAKING	
To be relevant and useful for decision making guidelines will:	
1.1. Address a health issue of importance	ARF and RHD are societal markers of disadvantage. In Australia these conditions are experienced at disproportionately high rates by First Nations peoples.
1.2. Clearly state the purpose of the guideline and the context in which it will be applied	The Guideline includes international, national, and locally informed standards, recommendations and guidance to support the Australian health acute care and primary health care workforce with prevention, diagnosis and management of ARF and RHD. A First Nations cultural safety framework underpins the recommendations to support culturally safe care. The threshold for treatment for skin and throat infections, and diagnostic criteria for ARF are lower for First Nations populations than for other Australians. Medical and surgical management of ARF and RHD is consistent for all Australians. The Guideline includes information targeting health staff working in rural and remote northern Australia where rates of ARF and RHD are high.
1.3. Be informed by public consultation	In 2019, Australia's health workforce was engaged to provide input into the direction of the 2020 Guideline edition. Feedback from end-users is considered on an ongoing basis and incorporated into subsequent editions. The Guideline is informed by RHD control programs and other key stakeholders during development. The draft Guideline is distributed to a wider group of stakeholders for review, feedback and endorsement. Stakeholders include peak clinical, Indigenous, and advocacy organisations, RHD Control Programs, and others for whom this information is intended to guide clinical and/or community practice.
1.4. Be feasible to implement	Guideline recommendations set a benchmark for best practice and provide the stimulus for improved services where indicated. RHD Control programs and other implementing organisations are consulted to discuss the impact of any significant changes. Recommendations are incorporated and implemented across the Australian acute and public health sectors, specifically: • Incorporated into local guidelines and policies. • Used to develop health workforce education and training programs. • Adopted by the RHD control programs and clinicians more broadly, to support care planning and align local and national reporting.

STANDARD 2 – BE TRANSPARENT	
To be transparent guidelines will make publicly available:	
2.1. The details of all processes and procedures used to develop the guideline	This document outlines the process for development and implementation of the Guideline. It is available online at https://www.rhdaustralia.org.au/arf-rhd-guidelines.
2.2. The source evidence	Sources of key information are cited directly (e.g. *Integration of management recommendations for all stages of RHD based on 2023 World Heart Federation guidelines*) In-depth discussion and rationale for key recommendations is provided within the text. A reference list is provided at the end of each chapter.
2.3. The declarations of interest of members of the guideline development group and information on how any conflicts of interest were managed	All contributors sign a Conflict of Interest declaration form developed by the Menzies Legal Office. Contributors declare any personal or non-personal conflict/s related to a) High-level benefit - position held, or direct investment in an activity that provides cash incentives. b) Low-level benefit - position held, or ad hoc or indirect investment in an activity that provides cash incentives. c) No benefit - position held, or investment in an activity that does not provide cash incentives.
2.4. All sources of funding for the guideline	The Guideline (edition 3.0 to edition 3.3) was funded by the Commonwealth of Australia and the Heart Foundation. This information is included in the Disclaimer statement inside the front cover.

STANDARD 3 – BE OVERSEEN BY A GUIDELINE DEVELOPMENT GROUP	
The guideline development group will:	
3.1. Be composed of an appropriate mix of expertise and experience, including relevant end users	The Guideline editorial group includes two Infectious Diseases Physicians who specialise in RHD, a senior cardiologist/researcher, a First Nations Principal Research Fellow and an RHD Technical Advisor. This group initiates content review, provides high level strategic direction and advice to the project as well as expert and timely support to the writing groups. The 2025 edition writing group included an appropriate mix of consumers, researchers, clinicians, policymakers and end users with relevant expertise and experience including health researchers, cardiologists, epidemiologists, primary healthcare staff, cardiac sonographers, First Nations health advisors, and RHD program staff. Contributors are based in Western Australia, Northern Territory, South Australia, Queensland, New South Wales, Victoria and New Zealand.
3.2. Have clearly defined, documented processes for reaching consensus	New recommendations suggested but which are supported by minimal evidence are discussed, and local data may be used to help support discussions for the Australian context. Where decisions are unresolved: 1. The issue is presented to the Steering Committee for discussion and further investigation. If not resolved, 2. External consultant/s and/or a multidisciplinary working group is engaged. The final decision is made by the editorial group after considering all of the evidence.

STANDARD 4 - IDENTIFY AND MANAGE CONFLICTS OF INTEREST	
To identify and manage conflicts of interest guideline developers will:	
4.1. Require all interests of all guideline development group members to be clarified	Contributors declare any personal or non-personal conflict/s (See Item 2.3 above)
4.2. Establish a process for determining if a declared interest represents a conflict of interest, and how a conflict of interest will be managed	A conflict of interest register is maintained and provided to the Menzies Legal Office. Legal staff identify conflicts which may impact the recommendations and depending on the type and significance of the conflict, the contribution may be omitted from the Guideline.

STANDARD 5 - BE FOCUSED ON HEALTH AND RELATED OUTCOMES	
To be focused on health and related outcomes guidelines will:	
5.1. Be developed around explicitly defined clinical or public health questions	This Guideline is intended to set a benchmark for best practice care for ARF and RHD in Australia based on a disease prevention framework. The fundamental question is how to eliminate RHD in Australia. To achieve this, new cases need to be prevented, and existing cases need to be managed. Specific questions answered in the Guideline include a) how to achieve healthy environments to prevent Strep A skin and throat infections, b) how to identify and treat Strep A infections to prevent ARF, c) how to deliver secondary prophylaxis to effectively prevent RHD, and d) how to manage RHD to prevent complications.
5.2. Address outcomes that are relevant to the guideline's expected end users	This Guideline informs the Australian acute care, community care, and public health workforce. Outcomes focus on prevention, diagnosis and management of ARF and RHD.
5.3. Clearly define the outcomes considered to be important to the person/s who will be affected by the decision, and prioritise these outcomes	People at risk of and living with ARF and RHD are primarily affected by the decisions resulting from use of the Guideline. Recommendations are designed to support evidence-based care that considers First Nations culture, and the outcomes First Nations peoples consider important. Considerations for culture and outcomes for First Nations people are clearly presented in orange boxes throughout the text. Examples: • *Workplaces must be free of racism, culturally safe and supportive, and attractive to the First Nations health workforce.* • *Discharge from hospital is a critical point in the patient journey. A health management plan should be developed in partnership with the hospital medical officer, nurse, First Nations Liaison Officer, and the patient and family. Where possible, the first outpatient medical appointment should be booked prior to hospital discharge.* • *People with ARF and RHD who are managed in the community should have an integrated care plan that includes nursing, medical, and allied health involvement, with consideration for tradition and culture, and which is centred on the needs of the patient.*

STANDARD 6 - BE EVIDENCE INFORMED	
To be evidence informed guidelines will:	
6.1. Be informed by well conducted systematic reviews	Systematic reviews form the basis for evidence in the Guideline. However, the 2025 revision is a minor and focused update to incorporate the World Heart Federation's (WHF) 2023 guidelines for the echocardiographic diagnosis of RHD. The 2023 WHF guidelines have been adopted in full and make up the majority of updated material.
6.2 Consider the body of evidence for each outcome (including the quality of that evidence) and other factors that influence the process of making recommendations including benefits and harms, values and preferences, resource use and acceptability	Local, national and international emerging and established evidence related to ARF and RHD is reviewed regularly to ensure that the Guideline drives best practice. The editorial group considers whether new recommendations are relevant to the Australian context and considers the impact of adopting recommendations on practice and policy. The process for maintaining currency of the Guideline is described in Figure 1.
6.3 Be subjected to appropriate peer review	Draft Guidelines are developed in collaboration with RHD Control Programs and other key stakeholders and subsequently provided to a wider group of stakeholders for review, feedback, and endorsement. Relevant feedback is incorporated into the final document prior to publication.

STANDARD 7 - MAKE ACTIONABLE RECOMMENDATIONS	
To make actionable recommendations guidelines will:	
7.1. Discuss the options for action	Where relevant, options for action are presented and discussed. Examples: • Acceptable sites for BPG injection are presented and described, and caution when using each site is explained, where indicated. • Strategies for managing injection pain, fear and distress include a hierarchy of options for supporting patients through BPG injections, with accompanying discussion of each strategy.
7.2 Clearly articulate what the recommended course of action is, and when it should be taken	Key recommendations are listed in tables at the beginning of each chapter with accompanying footnotes. Duration, timing and frequency of treatment is clearly stated. Examples: • Secondary antibiotic prophylaxis includes the antibiotic, dose, route and frequency for specific groups, including options for penicillin allergy. • Processes for notification and inclusion on registers outlines the process for notification of ARF and RHD by jurisdiction and includes links to notification forms.
7.3 Clearly articulate what the intervention is so it can be implemented	Interventions are clearly stated. Examples: • Strategies to implement the nine Healthy Living Practices to reduce the burden of Strep A skin and throat infections. • Priority classification and recommended follow-up includes elements of care with detailed timing and considerations for specific groups.
7.4 Clearly link each recommendation to the evidence that supports it	Recommendations include references within the text and references are provided at the end of each chapter.
7.5 Grade the strength of each recommendation	Grading of Recommendations Assessment, Development and Evaluation (GRADE) is summarised in a table at the beginning of each chapter where the level of evidence of a recommendation requires grading.

STANDARD 8 - BE UP TO DATE	
To be up-to-date guidelines will:	
8.1. Ensure that the recommendation is based on an up to date body of evidence	The 2025 revision was prompted by the 2023 World Heart Federation changes for diagnosis and classification of RHD.[1] Several other sections were updated during this review, for example a) The Burden of ARF and RHD chapter has been rewritten to include data from the 2024 Australian Institute of Health and Welfare report[2] and the 2020 ERASE Study.[3] b) The Secondary Prophylaxis chapter has been updated to highlight a) issues related with prefilled benzathine benzylpenicillin G stock shortages in 2023, and b) improved guidance for managing benzathine benzylpenicillin injection delivery based on feedback from Australian RHD Control Programs. c) The ARF Management chapter has been updated to include new recommendations for the pharmacological management of Sydenham chorea.[4] d) The New Technologies chapter includes an update of current research into alternative methods of penicillin delivery[5] and a Strep A vaccine.[6]
8.2 Propose a date by which the evidence and the guideline should be updated. This may be specific to each recommendation	The next comprehensive review is scheduled for November 2027. The Guideline is available online only. This provides the opportunity to update content at any time in line with significant and relevant new and emerging evidence.

STANDARD 9 - BE ACCESSIBLE	
To be accessible guidelines will:	
9.1. Be easy to find	For many years the Guideline has been available on a dedicated website that is well known as a central hub for ARF and RHD information in Australia and internationally. Since first published in February 2020, more than 164,000 downloads of the Guideline document have been recorded.
9.2 Ideally be free of charge to the end user	Access to the Guideline has always been free to everyone. Material can be reproduced with permission, at no cost.
9.3 Be clearly structured, easy to navigate and in plain English	Each chapter follows a standard format: • Important Changes (since last edition) • Key Information • Discussion • Case Study (where relevant). Table of Contents are provided at the front of the document separately for the chapters, tables and figures. Hyperlinks connect important information within and between chapters and to external content, and references at the end of each chapter include hyperlinks where available.
9.4 Be available online	The Guideline is available at https://www.rhdaustralia.org.au/arf-rhd-guidelines.

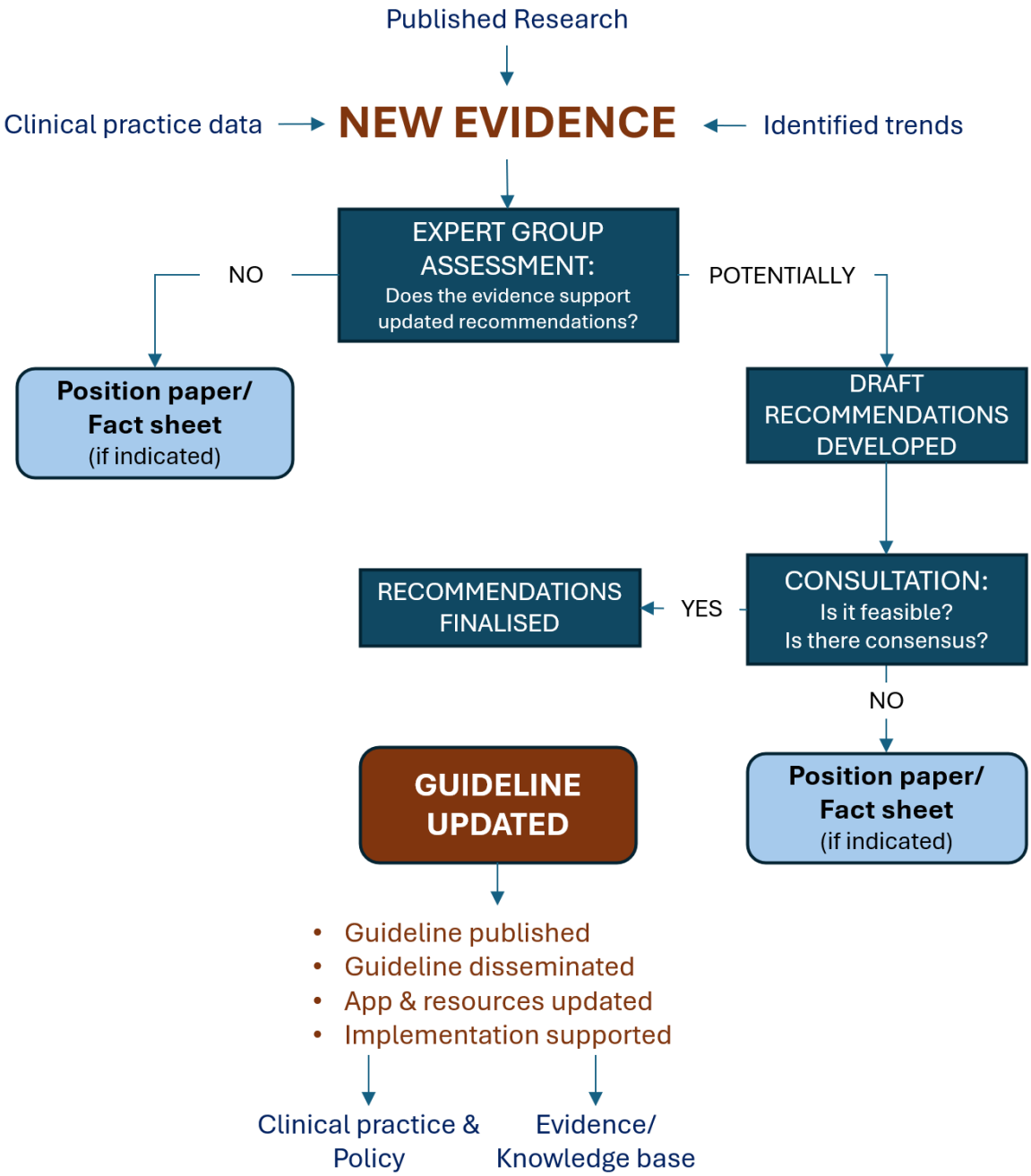

Figure 1. Process for managing new and emerging evidence

Guideline Implementation

Guideline implementation aims to increase awareness and understanding of best practice ARF and RHD prevention, diagnosis, and management among the Australian health workforce by reducing variation in clinical practice which is not evidence-based and/or does not align with best practice. This is done by disseminating and promoting the Guideline and other relevant documents to health service organisations, and by developing frameworks to support the sustainability of an evidence-based Guidelines. Recommendations outlined in the Guideline should be interpreted in line with patient clinical scenarios and local protocols.

The following topics are within the scope of healthcare service provision and have a substantial impact on patient health outcomes:

- Timely assessment and treatment of Strep A skin sore and throat infections in high risk populations.
- Timely and accurate ARF diagnosis.
- Managing suspected and confirmed ARF.
- RHD diagnosis on echocardiogram.
- Secondary prophylaxis of ARF.
- Access to care for First Nations people with RHD.

RHD Register and Control Programs, Public Health Units (PHUs), primary, secondary and tertiary health care providers, peak and industry bodies (and their members) are responsible for updating and aligning local policies, systems, and practice (where applicable) which are consistent with Guideline recommendations, and for promoting uptake of the recommendations and maintaining a skilled health workforce. They are also responsible to identify and address local barriers to providing best practice care. However, it is necessary and important that locally developed policies also comply with relevant jurisdiction legislation and be responsive to contextual issues.

The Guideline implementation plan is outlined in Appendix 1.

Appendix 1. Guideline Implementation Framework

TREATMENT FOR STREP A INFECTIONS				
Context	Guideline Recommendations	Target Audience	Activity/Strategy	Expected Outcomes
Assessment and management of sore throat and skin sores in high risk individuals to prevent ARF	Table 5.2 Risk groups for primary prevention of ARF Figure 5.3. Assessment for sore throat Table 5.5. Symptoms and signs of a sore throat / tonsillitis Table 5.3. Recommended antibiotic treatment for Strep A sore throat / tonsillitis Table 5.4. Recommended antibiotic treatment for Strep A skin sores	Primary and tertiary healthcare staff RHD Control Program Electronic medical record systems Public Health / Disease Control Units AIHW PHNs	Health workforce education and training (including clinical workshops and eLearning programs) Electronic record systems updated (Health Information Pathways, practice and prescribing software) Regional clinical practice guidelines and protocols updated Existing and new resources aligned or updated (including the ARF/RHD Guideline app) Dissemination through peak and industry bodies Newsletter and journal articles published with peer representatives	Health workforce has access to the Australian ARF/RHD Guideline Local guidelines and protocols for management of sore throat and skin sores align with national recommendations Timely assessment and treatment of Strep A infections in high risk groups incorporated into clinical practice

DIAGNOSIS OF ARF				
Context	Guideline Recommendations	Target Audience	Activity/Strategy	Expected Outcomes
Diagnosis (classification) of ARF as: • definite ARF (confirmed) • probable ARF • possible ARF • definite ARF recurrence • probable ARF recurrence • possible ARF recurrence	Table 6.2. Risk groups for ARF Table 6.3. Australian criteria for ARF diagnosis Table 6.4. Suggested upper limits of normal for serum streptococcal antibody titres in children and adults Table 6.5. Upper limits of normal for P-R interval Table 6.10 Uses of echocardiography in ARF Table 6.9 Differential diagnoses of common major presentations for ARF	Primary and tertiary healthcare staff RHD Control Programs Electronic medical record systems Public Health / Disease Control Units Medical laboratories AIHW PHNs	Health workforce education and training (including clinical workshops and eLearning programs) Electronic record systems updated (Health Information Pathways, practice and prescribing software) Regional clinical practice guidelines and protocols updated Existing and new resources aligned or updated (including the ARF/RHD Guideline app) Dissemination through peak and industry bodies Newsletter and journal articles published with peer representatives	Health workforce has access to the Australian ARF/RHD Guideline Local guidelines and protocols for ARF diagnosis align with Australian criteria Timely and accurate diagnosis of ARF

MANAGING SUSPECTED AND CONFIRMED ARF				
Context	Guideline Recommendations	Target Audience	Activity/Strategy	Expected Outcomes
Hospital admission for people with suspected and confirmed ARF Echocardiography for all suspected and confirmed ARF Culturally safe care	Pre-hospital management of suspected ARF (section) Indications for hospitalisation (section) Table 7.2. Priorities in managing ARF in the acute setting Table 7.3. Testing and monitoring of ARF in the acute setting Table 13.2. Processes for notification and inclusion on registers Education (section)	Primary and tertiary healthcare staff RHD Control Programs Public Health / Disease Control Units PHNs	Health workforce education and training (including clinical workshops and eLearning programs) Electronic record systems updated (Health Information Pathways, practice and prescribing software) Regional clinical practice guidelines and protocols updated Existing and new resources aligned or updated (including the ARF/RHD Guideline app) Dissemination through peak and industry bodies Newsletter and journal articles published with peer representatives	Health workforce has access to the Australian ARF/RHD Guideline Local guidelines and protocols for managing suspected ARF align with national recommendations Timely and safe management of people with suspected and confirmed ARF

DIAGNOSIS OF RHD				
Context	Guideline Recommendations	Target Audience	Activity/Strategy	Expected Outcomes
International criteria for diagnosis of RHD on echocardiogram	Table 8.3 Echocardiographic features of RHD Table 8.5. Diagnostic morphological features of RHD Table 8.6. Criteria for pathological valve dysfunction Table 8.7. Staging of RHD as detected by echocardiography based on WHF 2023 guidelines Table 8.8. Screening criteria for the echocardiographic features of RHD in individuals ≤20 years old	Medical and paediatric specialists Cardiologists Cardiac sonographers ARF/RHD registers	Accredited education sessions delivered by peers Disseminate information through peak and industry bodies Newsletter and journal articles published with peer representatives	Health workforce has access to the Australian ARF/RHD Guideline Local policies and guidelines align with international criteria Criteria for RHD diagnosis incorporated into practice

SECONDARY PROPHYLAXIS OF ARF				
Context	Guideline Recommendations	Target Audience	Activity/Strategy	Expected Outcomes
Regular, long-term secondary antibiotic prophylaxis to prevent recurrent ARF Culturally safe care	Table 10.2. Recommended antibiotic regimens for secondary prophylaxis Table 10.3. Recommended duration of secondary prophylaxis Managing injection pain and distress (section) Table 10.6 Strategies to improve the delivery of secondary prophylaxis	Primary and tertiary healthcare staff RHD Control Programs Electronic medical record systems Public Health / Disease Control Units AIHW PHNs	Health workforce education and training (including clinical workshops and eLearning programs) Electronic record systems updated (Health Information Pathways, practice and prescribing software) Regional clinical practice guidelines and protocols updated1 Existing and new resources aligned or updated (including the ARF/RHD Guideline app) Dissemination through peak and industry bodies Newsletter and journal articles published with peer representatives	Health workforce has access to the Australian ARF/RHD Guideline Local guidelines and protocols for secondary prophylaxis delivery align with national recommendations Recommendations incorporated into clinical practice

ACCESS TO CARE FOR FIRST NATIONS PEOPLE WITH RHD				
Context	Guideline Recommendations	Target Audience	Activity/Strategy	Expected Outcomes
Timely and supported access to recommended and relevant services Culturally safe care	Access to care (section) Table 11.2 Priority classification and recommended follow-up Table 11.3. Summary of medical and surgical management options for specific advanced valve disease Table 11.7. Antibiotics for infective endocarditis prophylaxis	Primary and tertiary healthcare staff Dental and surgical staff ARF/RHD registers Primary Health Care software PHNs Indigenous Liaison Departments	Medical, dental, surgical, and primary care workforce education and training (including eLearning and workshops) Electronic record systems updated (Health Information Pathways, practice and prescribing software) Regional clinical practice guidelines and protocols updated Existing and new locally produced resources aligned or updated Dissemination through peak and industry bodies Newsletter and journal articles published with peer representatives	Health workforce has access to the Australian ARF/RHD Guideline, and guidelines and protocols for management of RHD align with national recommendations Timely, coordinated, culturally safe care for RHD

References

1 Rwebembera J, et al. 2023 World Heart Federation guidelines for the echocardiographic diagnosis of rheumatic heart disease. Nat Rev Cardiol. 2024;21(4):250-263.

2 Australian Institute of Health and Welfare. Acute rheumatic fever and rheumatic heart disease in Australia. Cat. no: CVD 100. Australian Institute of Health and Welfare, Canberra, 2024

3 Katzenellenbogen JM, et al. Contemporary Incidence and Prevalence of Rheumatic Fever and Rheumatic Heart Disease in Australia Using Linked Data: The Case for Policy Change. J Am Heart Assoc. 2020;9(19):e016851

4 Tariq S, et al. Managing and treating Sydenham chorea: A systematic review. Brain and Behavior. 2023;13:e3035.

5 Kado J, et al. Subcutaneous Infusions of High-Dose Benzathine Penicillin G (SCIP) is Safe, Tolerable and Potentially Suitable for Less Frequent Dosing for Rheumatic Heart Disease Secondary Prophylaxis. Heart, Lung and Circulation. 2022;31(3):S301.

6 Walkinshaw DR, et al. The Streptococcus pyogenes vaccine landscape. NPJ Vaccines. 2023;8(1):16.