Antibiotic prophylaxis against infective endocarditis: time to rethink

Robert F W Moulds and Melanie S Jeyasingham
on behalf of the Infective Endocarditis Prophylaxis Expert Group, Therapeutic Guidelines Limited*

A decade of research has led to more precise guidelines for a complex health problem

It has long been considered that all patients with heart conditions that predispose to infective endocarditis should receive antibiotic prophylaxis when undergoing procedures that can lead to bacteraemia with organisms known to cause endocarditis. However, the evidence for such action is surprisingly poor.[1] It is based on isolated case reports of endocarditis following dental or other procedures, and on theoretical considerations, rather than the results of randomised controlled trials.

The American Heart Association (AHA) has published guidelines for endocarditis prophylaxis since 1955. In Australia, all editions of the *Antibiotic guidelines* (now *Therapeutic guidelines: antibiotic*, version 13[2]) have also included recommendations for antibiotic prophylaxis against endocarditis.

Of necessity, these guidelines have been complex, as three major variables were considered — the lifetime risk of endocarditis due to the underlying heart condition, the likelihood and nature of bacteraemia following the procedure, and the risk of adverse effects from antibiotic therapy.[2] The lifetime risk associated with the cardiac condition was divided into three risk categories (high, medium and low), and the likelihood of bacteraemia from a procedure was similarly divided into risk categories.

Thus, prophylaxis has been firmly recommended for patients with an underlying heart condition who are at high risk of endocarditis and are undergoing a procedure that has a high risk of leading to significant bacteraemia. Conversely, it has not been recommended for patients with conditions who are at low risk of endocarditis and are undergoing procedures with a low risk of leading to significant bacteraemia. Prophylaxis has been "possibly" and "probably" recommended for various intermediate-risk combinations.

Over the past 10 years, thinking has changed for three main reasons. First, there is now strong evidence that bacteraemia with endocarditis-causing organisms frequently occurs following everyday activities, such as tooth brushing.[3-6] Second, it has been recognised that very few cases of endocarditis can reasonably be attributed to a preceding procedure and are more likely to have resulted from everyday activities. Third, it has been realised that we should be more concerned about patients who are likely to have a poor outcome if they develop endocarditis than those who are at high risk of developing endocarditis at all.[1]

In the context of this change in thinking, organisations around the world (including the AHA) have published new guidelines for endocarditis prophylaxis that differ considerably from the previous versions.[1,7,8] In Australasia, at the request of the Heart Foundation (formerly, the National Heart Foundation of Australia) and The Cardiac Society of Australia and New Zealand, Therapeutic Guidelines Limited convened an expert group to reconsider its guidelines.

This expert group updated the Australian guidelines largely along the lines of the new AHA guidelines, continuing a trend to

reduce the categories of patients for whom prophylaxis is recommended, while still specifying procedures for which it is required.

In summary, the changes are:

- The list of heart conditions for which endocarditis prophylaxis is recommended is much shorter and is largely limited to conditions in which foreign material is implanted in the heart. In this setting, endocarditis is very difficult to eradicate, so an adverse outcome is more likely. Of note, the list does not include rheumatic valvular heart disease in non-Indigenous patients or mitral valve prolapse.
- The list of dental and respiratory procedures for which endocarditis prophylaxis should be given is more precise. For some dental procedures, the guidelines emphasise that the need for prophylaxis relates more to the circumstances of the procedure and the patient's periodontal condition than to the procedure itself.
- The list of gastrointestinal and genitourinary procedures is similarly precise, and includes procedures that also have a requirement for surgical antibiotic prophylaxis, or which are being carried out in the presence of a related infection.

The only significant difference between the new Australian guidelines and the AHA guidelines is that rheumatic valvular heart disease in Indigenous Australians has been retained in the list of cardiac conditions for which prophylaxis should be given. Experienced clinicians have the strong impression that the outcome of endocarditis in Indigenous Australians is poorer than in non-Indigenous Australians, possibly in part because of delays in diagnosis and therapy. Studies are currently being undertaken to determine whether this clinical impression is correct, but until the results are available, it was thought wise to retain this indication.

These new guidelines might cause confusion at first, particularly when patients who previously received prophylaxis are advised that it is no longer necessary. To help ease this confusion, the new guidelines state that it is reasonable to give prophylaxis to patients who have previously received it and would prefer to be given it again.

The new Australian guidelines are available free of charge on the Therapeutic Guidelines website (http://www.tg.com.au) and in its electronic publications (*eTG complete* and *miniTG*). The print versions of *Therapeutic guidelines: antibiotic* and *Therapeutic guidelines: oral and dental* will be updated as the new editions are published. We recommend these guidelines to Australian practitioners and trust they will find them useful and decide to follow them.

Author details

Robert F W Moulds, BMedSc, PhD, FRACP, Professor and Acting Dean[1]
Melanie S Jeyasingham, BPharm, MPS, Editor[2]
1 Fiji School of Medicine, Suva, Fiji.
2 Therapeutic Guidelines Limited, Melbourne, VIC.
Correspondence: r.moulds@fsm.ac.fj

*** Infective Endocarditis Prophylaxis Expert Group, Therapeutic Guidelines Limited**

Robert F W Moulds (Chair), Fiji School of Medicine, Suva, Fiji; **Bart J Currie,** Menzies School of Health Research and Royal Darwin Hospital, Darwin, NT; **Christopher G Daly,** University of Sydney, Sydney, NSW; **Alastair N Goss,** University of Adelaide, Adelaide Dental Hospital and Royal Adelaide Hospital, Adelaide, SA; **Julian A Smith,** Monash University and Monash Medical Centre, Melbourne, Vic; **Neil F Strathmore,** University of Melbourne, Royal Melbourne Hospital and Cato Cardiology, Melbourne, Vic; **Alan C Street,** Victorian Infectious Diseases Service, Royal Melbourne Hospital, Melbourne, Vic; **Melanie S Jeyasingham,** Therapeutic Guidelines Limited, Melbourne, Vic.

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