1. INTRODUCTION

The global emergence of methicillin-resistant *Staphylococcus aureus* (MRSA) resistant to all beta-lactam antibiotics is recognised worldwide as an important cause of infections in both community and healthcare settings. In Western Australia (WA), MRSA is a notifiable condition via laboratory reporting to the PathWest Gram Positive Typing Laboratory.

New cases of MRSA infection are characterised as being caused by community-associated (CA-MRSA) or healthcare-associated (HA-MRSA) strains, based on molecular typing. They can be further classified according to the presence of the gene for Panton-Valentine leukocidin (PVL), a toxin that can be present in any *Staphylococcus aureus* isolate and is associated with white blood cell destruction. CA-MRSA strains have distinct clinical, epidemiological and bacteriological characteristics compared to HA-MRSA strains. CA-MRSA strains have adapted to survive and spread successfully in the community environment. Spread of HA-MRSA strains is generally not sustained in the community, but they do spread efficiently in healthcare facilities (HCFs).

The impact of MRSA in WA HCFs has been successfully limited by state-wide strategies introduced in the early 1980s. The incidence of HA-MRSA in our HCFs has remained relatively stable, hence HA-MRSA strains are not the focus of this Information Circular.

2. CA-MRSA

CA-MRSA strains were first reported in the remote areas of the Kimberley region in the early 1990s. These strains, known as WA-MRSA, are now the predominant strains isolated in WA and are mostly PVL-negative. Imported interstate and international CA-MRSA strains consistently carry the PVL gene and were first reported in WA in 2001. The majority of cases present with skin and soft tissue infections (SSTIs), however, severe community-onset invasive disease has, on occasions, been reported in WA, including necrotising pneumonia, bacteraemia, endocarditis and osteomyelitis.

There is now a growing body of evidence that PVL-positive *S. aureus* strains are not inherently more virulent than PVL-negative strains, as was previously thought, and that disease severity does not seem to differ significantly between the different strains of CA-MRSA. A recent literature review and meta-analysis on the role of PVL in infection concluded that:

- PVL-positive strains are strongly associated with SSTIs but are comparatively rare in severe invasive disease such as pneumonia, bacteraemia and musculoskeletal infections.
• SSTIs caused by PVL-positive strains were more likely to receive short-stay surgical treatment, however, there is no evidence suggesting a worse outcome compared to SSTIs caused by PVL-negative strains, provided they received appropriate treatment and the correct antibiotics.

• PVL is not the main determinant of disease severity or adverse outcomes, rather, these are likely to be a result of a combination of host characteristics and other specific virulence factors of the causative strain.

3. CA-MRSA PROGRAM

The CA-MRSA program commenced in January 2008 and is reviewed annually by an Expert Advisory Group (EAG) comprising clinical and public health specialists. The recommendations from the EAG reflect evidence-informed practice based on the current scientific body of knowledge. The program is implemented by the Healthcare Associated Infection Unit (HAIU) within the Communicable Disease Control Directorate (CDCD), Department of Health.

Since 2008, the CA-MRSA program has targeted PVL-positive strains of CA-MRSA, as it was thought that these strains posed the most danger to public health in WA. Following a review in 2012, and in light of the new evidence on the role of PVL and the increasing incidence of both PVL-positive and PVL-negative strains in WA, the CA-MRSA EAG recommended that the focus of the program should be on all people who acquire CA-MRSA, not just those with PVL-positive strains. In addition, recommendations were made for the management of individuals identified with CA-MRSA strains that are rare in WA, but considered to be of particular significance owing to their increased virulence, transmissibility, or resistance to antibiotics.

The following strategies have been implemented which will build on the success of existing Department of Health policies for the management of MRSA. Further details of the program are described in Appendix 1.

3.1 Surveillance

Ongoing surveillance and epidemiological typing of all MRSA isolates continues through the PathWest Gram Positive Typing Laboratory and allows for:

• notification of all new isolates of CA-MRSA to the HAIU
• monitoring of CA-MRSA trends in WA to inform future action
• identification and reporting of the emergence of rare strains of MRSA in WA that are considered significant by the CA-MRSA EAG
• the appropriate management of outbreaks in non-hospital settings (e.g. dormitory, day care centre, sports club) by the appropriate Public Health Unit.

3.2 Notification and Education

All individuals identified with a CA-MRSA infection will receive a letter advising them to attend their primary healthcare provider if they have active or recurrent infection. A letter for them to take to their primary care provider will be included in the letter to them.

This strategy aims to increase knowledge and awareness of CA-MRSA amongst consumers and primary healthcare providers to ensure CA-MRSA cases receive the correct antibiotic treatment and management in order to minimise the risk of recurrent infections and severe disease.
When an individual is identified with a rare strain of CA-MRSA that is deemed to have increased virulence, transmissibility, or resistance to antibiotics, the primary healthcare provider will receive direct notification and management advice from the HAIU.

3.3 Resources

A range of resources for both consumers and healthcare providers have been developed, including information sheets for consumers, medical management of SSTIs, appropriate antibiotic therapy and indications for decolonisation treatment. Visit www.health.wa.gov.au/ca-mrsa for consumer information and www.health.wa.gov.au/community-mrsa for healthcare providers.

The PathWest Gram Positive Typing Laboratory reports can be accessed from: www.public.health.wa.gov.au/3/455/2/reports_healthcare_associated_infection_unit.pm

4. BIBLIOGRAPHY


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This information is available in alternative formats on request for a person with a disability

Community-associated methicillin resistant Staphylococcus aureus (CA-MRSA) Program in Western Australia
Components of the CA-MRSA Program in Western Australia

<table>
<thead>
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<th>Program element</th>
<th>Details of program and recommendations</th>
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| Correspondence  | • Individuals are sent a letter informing them they have CA-MRSA. They are advised to attend their primary healthcare provider if their infection has not resolved, if they have recurrent infections, or if members of their household have infections. A letter for their healthcare provider and a consumer fact sheet Information on CA-MRSA are included.  
• Individuals with repeat infections (same strain) more than 6 months apart will be sent another letter. |
| Laboratory information | • The laboratory that processed the specimen and laboratory report number will be included in the letter. |
| Management by primary healthcare provider | • Refer to information sheet: Management of CA-MRSA – information for healthcare providers |
| Decolonisation | • Decolonisation is recommended for individuals and their household contacts when:  
  - they have recurrent infections  
  - they are at increased risk of acquiring staphylococcal infection, such as those with chronic skin disorders, diabetes, peripheral vascular disease or immunosupression  
  - they are healthcare workers or carers  
  - there are ongoing infections occurring in a close group, such as a day care centre, hostel or dormitory.  
• Refer to information sheets:  
  - MRSA Decolonisation treatment – information for healthcare providers  
  - MRSA Decolonisation treatment – information for consumers |
| Screening to detect asymptomatic carriage in household contacts | • Not routinely recommended but can be done at the discretion of the primary healthcare provider or if requested by an individual. |
| Post-decolonisation screening | • Not routinely recommended but can be done at the discretion of the primary healthcare provider to determine efficacy of the decolonisation treatment or if there are ongoing infections in a household. |
| Information | • Information for healthcare providers and consumers is available from:  

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<th>Program element</th>
<th>Additional recommendations for rare strains* of CA-MRSA</th>
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| Correspondence  | • All individuals are sent an advisory letter informing them they have a rare strain of CA-MRSA. They are advised to attend their primary healthcare provider to discuss management. A letter for their healthcare provider and a consumer fact sheet Information on CA-MRSA are included.  
• An advisory letter is sent to the doctor who requested the specimen from which the CA-MRSA is isolated. |
| Decolonisation  | • Is required for every case following successful treatment of the infection.  
Is also recommended for household contacts when:  
  - they have recurrent staphylococcal-like infection  
  - they are at increased risk of acquiring staphylococcal infection, such as those with chronic skin disorders, diabetes, peripheral vascular disease and immunosupression  
  - they are healthcare workers or carers. |
| Post-decolonisation screening | • Screening is required for clearance at week 1 and week 12 post-decolonisation. |

* Rare strains: these are defined here as those relatively uncommon CA-MRSA strains that are of particular significance owing to their increased virulence, transmissibility, or resistance to antibiotics.