AUSTRALIAN COMMISSION ON SAFETY AND QUALITY IN HEALTH CARE

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Staphylococcus aureus and the AURA Surveillance System

Information Series

The AURA Program have prepared this document on behalf of the Australian Commission on Safety and Quality in Health Care

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Staphylococcus aureus and the AURA Surveillance System

This information is drawn from AURA 2016: first Australian report on antimicrobial use and resistance in human health (AURA 2016), and provides a general summary of this report's information on *Staphylococcus aureus*, a key priority organism monitored through the AURA Surveillance System.

What is *Staphylococcus aureus*?

Twelve bacteria, or bacterial families, have been identified as the most important for monitoring in Australia. Some of these bacteria are important to monitor because they are a common cause of infection or spread easily, while others are important to monitor because they can have a significant impact on a person's health when they do cause infection. *Staphylococcus aureus* (*S. aureus*) is one of the latter of these bacterium.

S. aureus, commonly called 'golden staph', is a bacterium which frequently lives harmlessly on the skin or in the nose of humans. This is called colonisation, and about 30% of humans are colonised at any one time. *S. aureus* can cause disease when it gains access to the bloodstream or enters the body via a cut or wound.

What types of infections are caused by *S. aureus*?

S. aureus can cause minor skin infections such as boils, school sores (impetigo), and wound infections. It can also cause more serious infections such as cellulitis, bone and joint infections, and more rarely lung infections (pneumonia), heart valve infections (endocarditis) and bloodstream infections (septicaemia).

What do we know about resistance to antibiotics in *S. aureus* in Australia?

S. aureus resistance to penicillin emerged in the 1950s and 1960s and now 85–90% of strains in the community are resistant. Methicillin, a chemical modification of penicillin, was introduced to overcome resistance to penicillin, but by the late 1970s strains resistant to methicillin (methicillin-resistant *S. aureus,* or MRSA) had become established in many major hospitals in eastern Australia. In the 1980s different types of MRSA also began to appear in the community. By 2015, there were as many serious infections across Australia caused by community-type MRSA as those caused by hospital-type strains, and they were becoming increasingly common in the community.

Who is at risk of infections caused by *S. aureus*?

S. aureus is a common cause of infection among people in the community, in hospitals, other healthcare facilities and aged-care facilities.

In the community, risk of serious infection is higher in people who:

- have low immunity, such as from cancer treatment or from transplants
- have diabetes requiring insulin
- have HIV/AIDS
- have skin damage from repeated injury, skin ulcers or skin diseases such as eczema

In hospitals and aged-care, risk of serious infection with *S. aureus* is highest for patients who:

- are undergoing cancer treatment or transplantation
- are undergoing dialysis
- are in intensive care units
- have had surgery of any type that goes through the skin
- have urinary catheters or intravenous (IV) catheters
- have received joint replacements of similar types of medical devices inserted

How is *S. aureus* spread?

S. aureus is mostly spread by contaminated hands after contact with a colonised or infected person or with contaminated surfaces and equipment.

What can be done to prevent the spread of *S. aureus*?

Prevention of the spread of *S. aureus* is most important in hospitals. Spread can be prevented by good hand hygiene by patients and healthcare workers and other carers and cleaning of frequently touched surfaces. Good hand hygiene involves applying alcohol-based hand rub before and after patient contact and contact with surfaces and equipment in a room where an infected person is being cared for.

Hospitals may sometimes prevent the spread of MRSA by screening to find patients who are colonised so that special infection control measures can be put in place. This might include a single room and use of protective equipment such as gowns and gloves for healthcare staff and visitors. It might also include asking a patient to use an antiseptic body lotion and/or antibiotic cream for the nose while in hospital. Careful selection and use of antibiotics by doctors is also important.

What treatments are there for infections caused by *S. aureus*?

Penicillin and related antibiotics such as amoxicillin are rarely used now for treatment of *S. aureus* infections. Instead, antibiotics specifically designed to overcome resistance, such as methicillin, were developed to treat infections cause by penicillin-resistant *S. aureus*, and modern versions include flucloxacillin and dicloxacillin. A related class of antibiotics, called the cephalosporins, are also used, especially in patients who are allergic to penicillin.

Many infections caused by community type MRSA can be treated with antibiotics such as trimethoprim-sulfamethoxazole or clindamycin. Infections with multi-resistant MRSA like those found in hospitals may be more difficult to treat, and may require combinations of antibiotics or ones with more side effects. Serious MRSA infections of both hospital and community types are usually treated with vancomycin. There is now evidence that vancomycin doesn't work as well against MRSA as flucloxacillin does for infections caused by *S. aureus* that are susceptible to methicillin. Unfortunately there are no newer antibiotics that have proven to be better than vancomycin.

What is being done to control MRSA and keep patients safe?

Australia has developed a National Antimicrobial Resistance Strategy which commenced in 2015. All Australian governments are working with doctors, nurses and hospitals on a

nationally consistent approach to strengthening infection control and appropriate use of antibiotics. The Australian Commission on Safety and Quality in Health Care (the Commission) is supporting that work as part of its Healthcare Associated Infection Program, including the Hand Hygiene Australia program.

The Commission has also established the Antibiotic Use and Resistance in Australia (AURA) surveillance system. AURA has partnered with existing surveillance programs and laboratories to monitor antibiotic resistance and groups which monitor antibiotic prescribing and use to set up a system to regularly monitor changes in resistance patterns and appropriateness of prescribing. AURA supports analysis and reporting on the information which is collected. AURA has also developed a Critical Antimicrobial Resistance Alert (CARAlert) System to inform the health system and governments of emerging and re-emerging highly resistant bacteria.

More information

A consumer factsheet on MRSA is available at**:** MRSA Consumer Information.