MRSA (Meticillin-resistant staphylococcus aureus)

Infection with MRSA bacteria mainly occurs in people who are already ill in hospital. It can be difficult to treat MRSA, as the bacteria are resistant to most types of antibiotic medicines. Many people are carriers of MRSA without even realising it, as MRSA often does not cause symptoms in healthy people.

What is MRSA?

MRSA stands for **meticillin-resistant *Staphylococcus aureus***. It's a type of bacteria, and is sometimes known as a superbug. There are various strains (subtypes) of *S. aureus* and some strains are classed as MRSA. Strains of MRSA are very similar to any other strain of *S. aureus*. That is, some healthy people are carriers and some people develop the types of infections described above.

Most *S. aureus* infections can be treated with commonly used antibiotics. However, MRSA infections are resistant to an antibiotic called meticillin and also to many other types of antibiotics. Antibiotic resistance means that the germs (bacteria) are not killed by the antibiotic.

MRSA has become much more common since the 1980s. MRSA is now the cause of over 4 in 10 bloodstream infections with *S. aureus*.

Is MRSA contagious?

Yes it is. MRSA can be spread by skin-to-skin contact with someone who has it, or by touching something they've also touched. It's commonly passed on via towels, sheets and clothing. Most healthy people will not become infected with MRSA, but may carry it and infect others if they come into contact with it.

What is Staphylococcus aureus?

S. aureus is a germ (bacterium). It is sometimes called 'staph' (as in 'staph infection').*S. aureus* bacteria are often found on the skin and in the nose of healthy people. These people are called *S. aureus* carriers. In healthy people who are carriers, *S. aureus* is usually harmless.

However, staph bacteria sometimes invade the skin to cause infection. This is more likely if you have a cut or graze which can allow germs to get under the surface of the skin. *S. aureus* is the cause of skin infections such as:

- Boils.

- Pimples.

- The skin infection called impetigo.

- Collections of pus in the skin (abscesses).

- Commonly, wound infections.In some people.

S. aureus can sometimes get into the bloodstream and travel to internal parts of the body to cause more serious infections. For example, blood poisoning (septicaemia), lung infection (pneumonia), bone infection (osteomyelitis), heart valve infection (endocarditis), etc. People who are already unwell or physically weak (debilitated), or who have a poor immune system are at higher risk of catching these serious infections. These infections need to be treated with antibiotics.

How serious is an MRSA infection?

MRSA strains of germs (bacteria) are no more aggressive or infectious than other strains of *S. aureus*. However, infections are much more difficult to treat because many antibiotics do not work against MRSA. Infections with MRSA can sometimes become more severe than they may otherwise have been. For example, if the cause of the MRSA infection is not diagnosed early and antibiotics that are not effective are given at first.

Who gets MRSA?

MRSA occurs most commonly in people who are already in hospital, especially if they have been in hospital for a length of time. Some wards in the hospital have higher rates of MRSA (for example, intensive care units) than others. People who are more prone to MRSA are those who are very ill, who are HIV-positive or have wounds or open sores (for example, bedsores or burns). The wounds or sores may become infected with MRSA and the infection is then difficult to treat. Infections which start in the skin may spread to cause more serious infections. Also, thin, flexible tubes called urinary catheters and tubes going into veins or other parts of the body (drips, etc) are sometimes contaminated by MRSA. This can lead to urine or blood infection.

MRSA can also cause infections in people outside hospital but much less commonly than in hospitalised people. This is known as community-acquired MRSA. It is particularly seen in nursing and residential homes.

What are the symptoms of MRSA?

MRSA can affect you in two ways: either you are a carrier of MRSA or you have an infection caused by MRSA.

MRSA colonisation (carrier of MRSA)
This occurs when MRSA grows in or on your body with no signs or symptoms of an infection. Many people carry MRSA without it causing any symptoms whatsoever. The most common place for colonisation is your armpits, nostrils, skin (especially if you have eczema), throat and urine. This colonisation can act as a reservoir which means that MRSA infections can later either develop in your body or spread to other people.

If you know you are a carrier of MRSA and are due to go into hospital - for example, for an operation - then you should let the hospital know before you go in. This will not necessarily delay or prevent your admission.

If you are found to be a carrier of MRSA then you are likely to be offered treatment which will then prevent future infections or the spread of MRSA. This treatment is usually in the form of ointment to put inside the nose, or antiseptic washes, depending on where the germs (bacteria) have been found on your body. It is still uncertain from clinical trials as to which treatment is the most effective.

MRSA infection

Infections with MRSA are usually associated with high temperatures (fevers) and signs of the infection. As mentioned, most commonly these are infections of the skin and soft tissues - like boils and collections of pus (abscesses). Less commonly, MRSA can cause lung infection (pneumonia) and urine infections.

How do you get MRSA?

MRSA spreads from person to person, usually by direct skin-to-skin contact. MRSA is usually caught from hospitals. Spread may also occur by touching sheets, towels, clothes, dressings, etc, which have been used by someone who has MRSA. Ways to prevent spread of MRSA include:

- Washing your hands regularly. You may be asked to use an alcohol hand rub when entering and leaving a hospital.

- Ensuring all cuts are covered with a waterproof dressing.

- Wearing gloves if you are in contact with a person with MRSA. This does not mean if you are just talking to someone though.

- Avoiding sharing towels, face cloths, etc, with people who have MRSA.

However, as mentioned, *S. aureus* (including MRSA strains) will not normally cause an infection if you are well and healthy. The germs may get on to your skin but do no harm. So, for example, people who visit patients with MRSA, or doctors and nurses who treat people with MRSA, are not likely to develop an MRSA infection. However, they may become colonised with the germs and may pass them on to someone who is ill, or who has a wound, who then may develop infection.

How is MRSA diagnosed?

If infection with *S. aureus* is suspected then, depending on the infection type, the following may be taken to be sent to the laboratory:

- Blood.

- Urine.

- Body fluid.

- A sample (swab) taken from a wound.

If *S. aureus* is detected, further tests are done to see which antibiotics will kill the germs (bacteria). MRSA strains can be identified by seeing which antibiotics kill the germs found on testing. Healthy people suspected of being carriers of MRSA can have a swab of the nose or skin taken and tested.

How is MRSA treated?

MRSA infections are usually only treated with antibiotics if they are causing a problem. (Boils or collections of pus (abscesses) caused by MRSA may only need to be drained and may not need antibiotics.) However, the choice of antibiotic is limited, as most antibiotics will not work.

Many MRSA infections can only be treated with antibiotics that need to be given directly into a vein. The course of treatment is often for several weeks. Also, the risk of side-effects with the limited choice of antibiotics is higher than the more usual antibiotics which are used to treat non-MRSA infections.

How to prevent MRSA

The number of MRSA infections in hospital can be kept down if all hospital staff adhere to good hygiene measures. The most important measure is to wash hands before and after contact with each patient and before doing any procedure. This simple measure reduces the chance of passing on germs (bacteria) from patient to patient.

In hospitals, other measures are used to reduce the spread of infection. For example, cleaning of bedding, regular cleaning of wards, etc. Patients with an MRSA infection may be kept away from other patients, perhaps in a single-bed room or in an isolation unit until the infection has cleared.

If you are found to be a carrier of MRSA then you are usually offered treatment which prevents future infections or the spread of MRSA. This is called decolonisation treatment.

Is MRSA screened for in the UK?

MRSA screening for most people going into hospital has been introduced fairly recently. This is usually done by taking samples (swabs) from different areas of the body. The areas swabbed will depend upon your local hospital policy but it usually involves swabbing the nose. Other areas, such as your armpit and groin, may also be swabbed. This may be done in a clinic or sometimes at your GP surgery. The results usually take 3-5 days to come back. The guidelines as to who is screened do vary between hospitals but, in general, you will not be included in this screening if you:

- Are having a minor procedure such as an arthroscopy or minor hand surgery.

- Are having day case eye surgery such as a cataract operation.

- Are having minor skin procedures - for example, freezing treatment for warts.

- Are attending the hospital for a reason other than medical or surgical treatment (for example, for respite care or for pain treatments).

- Are a child or are pregnant (unless you are having a planned caesarean section).

If you are attending a hospital regularly (for example, for regular dialysis) then it is recommended that you should be screened for MRSA at the start of your treatment and thereafter at regular intervals.

If you attend a hospital as an emergency patient then you should also be screened for MRSA. However, this is not the case if you attend a casualty department without needing to be admitted to the hospital.

If you are found to be carrying MRSA before you go into hospital then you will be given treatment to destroy (eradicate) it as much as possible (see above under 'MRSA colonisation'). This means the chances of you getting an actual MRSA infection or passing MRSA on to another patient are much smaller.

Is MRSA screening effective?

In England, MRSA infection rates in hospitals are falling. This has mainly been done by:

- Better infection control between staff in hospitals.

- Improved hand washing.

- Deep cleaning of wards.

- Screening for people attending hospitals.

Further reading

- Joint Healthcare Infection Society (HIS) and Infection Prevention Society (IPS) guidelines for the prevention and control of meticillin-resistant Staphylococcus aureus (MRSA) in healthcare facilities; October 2021
- Treatment of methicillin-resistant Staphylococcus aureus (MRSA): updated guidelines from the UK; JAC Antimicrobial Resistance, 2021
- MRSA (Meticillin resistant Staphylococcus aureus); NHS Community Infection Prevention and Control Policy for Care Home settings, July 2020
- Siddiqui AH, Koirala J; Methicillin Resistant Staphylococcus Aureus

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Authored by:	Peer Reviewed by: Dr Toni Hazell	
Originally Published: 19/11/2023	Next review date: 31/07/2022	Document ID: doc_4831

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