



# Prescribing Points

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## MRSA Bacteraemia – still just a hospital problem?

*Staphylococcus aureus* (*S.aureus*) is a common coloniser of human skin (especially axilla or groin) and mucosa (especially the nose), but can cause disease, particularly if there is an opportunity for the bacteria to enter the body. *Staphylococcus aureus* is commonly found on the skin and/or nose of approximately 30% of the population.

Meticillin (formerly Methicillin) Resistant *Staphylococcus aureus* (MRSA) are a type of *Staphylococcus aureus* resistant to meticillin and usually to some other antibiotics that are normally used to treat *Staphylococcus aureus* infections e.g. flucloxacillin. Nationally, MRSA is found on the skin and/or nose of approximately 3% of the population. Confirmation of the presence of MRSA may occur via routine laboratory tests on clinical specimens (e.g. sputum or urine samples) or screening swabs. The presence of MRSA, as with sensitive strains of *S. aureus* may indicate colonisation (presence of the bacteria with no adverse effects) or infection. Most patients who are colonised with MRSA do not go onto develop an infection. However, these organisms are also the major bacterial cause of skin, soft tissue and bone infections, and healthcare-associated bacteraemia, with problems ranging from superficial skin conditions to severe, sometimes fatal, systemic disease.

Patients with MRSA provide a reservoir from which there may be spread to others. MRSA can be transferred from people infected with MRSA, those who are colonised with MRSA and rarely animals. Transmission is by direct contact usually spread by the hands. It is unusual for MRSA to be spread in the environment; however MRSA can survive in dust therefore good housekeeping is essential to reduce the spread of infection.

MRSA is prevalent in the community, as well as acute hospitals, but in general poses less of a risk to people as the population is generally less susceptible to infection than hospital in-patients. The extent of people colonised locally with MRSA in the community is unknown although it is likely residential/nursing care homes provide a significant reservoir. Local and national initiatives have been introduced to control the disease; a copy of the PCTs [Prevention and Management of MRSA Policy](#) and the [MRSA Screening and Decolonisation Protocol](#) are available on the PCT Intranet.

## Colonisation, Infection, Bacteraemia & Screening

MRSA colonisation describes the presence of MRSA on the skin and/or nose but with no cellular damage.

MRSA can also be present in wounds and can therefore cause local infection resulting in the classic signs of infection.

Bacteraemia describes the presence of MRSA / *S.aureus* in the blood; septicaemia can then follow. The symptoms are not specific to MRSA and can be the same for other bacteria that cause septicaemia (systemic infection of the blood). Typically symptoms can include high fever; raised white cell count; rigors (shaking); disturbance of blood clotting with a tendency to bleed and failure of vital organs. This kind of MRSA infection has the highest death rate.

The aim of MRSA screening (see previous [Prescribing Points 18.08 June 2009](#)) is to identify patients that are colonised with MRSA and in so doing reduces the risk of a bacteraemia happening; patients then receive suppression (i.e. MRSA may not be completely eliminated from the skin but will be suppressed whilst the patient is in hospital).

## Healthcare-associated MRSA & Community-associated MRSA

'Healthcare-associated' MRSA (HA-MRSA) emerged in the 1960s as a cause of infection in hospital or other healthcare settings, or in the community after hospital discharge. More recently, 'community-associated' MRSA (CA-MRSA) has been described; patients infected with this type of organism typically have no history of hospitalisation or residence in long-term care.

A typical patient with **HA-MRSA**:

- is elderly with co-morbidities
- has a history of hospitalisation or nursing care residence
- is colonisation with the organism or has taken antibacterial drugs (see next section)
- is on dialysis; has chronic wounds or has a urinary catheter

The organism can cause bacteraemia with no obvious focus of infection; it is also found in surgical wounds, open ulcers and intravenous lines. HA-MRSA organisms are transmitted within healthcare settings and are often multiply drug-resistant.

The typical patient with **CA-MRSA** is young and generally healthy, with no significant medical history or healthcare contact, and the organism is isolated in an outpatient or community setting or within 48 hours of hospital admission. The organism can cause skin and soft tissue infections; it may also cause severe infections, associated with septic shock, such as community-acquired pneumonia, or bone or joint disease. The prevalence of CA-MRSA worldwide is low (thought to be under 0.5% of all MRSA), but this is increasing. Laboratory diagnosis of CA-MRSA shows high levels of resistance to flucloxacillin and penicillin.

Further Reading:

- [Drugs and Therapeutics Bulletin](#). The Management of community-associated MRSA. Vol 48; No 2; February 2010 <subscription required>

## Antibacterials

A table for systemic antimicrobials 'risk' to pre-dispose patient to superinfection with *C.difficile* or MRSA has been developed and is shown below:

High Risk	Intermediate Risk	Low Risk	
cefalexin cefotaxime ceftriaxone cefuroxime clindamycin ciprofloxacin & quinolones	amoxicillin co-amoxiclav azithromycin clarithromycin erythromycin	benzylpenicillin co-trimoxazole gentamicin & aminoglycosides phenoxymethylpenicillin rifampicin & anti-TB agents sulphonamides tetracyclines vancomycin	chloramphenicol flucloxacillin fusidic acid metronidazole nitrofurantoin teicoplanin trimethoprim

Where test results show sensitivities to a selection of antimicrobial agents, use the one with the lowest risk.

## Who is at risk?

Factors that increase the risk of infection with MRSA are:

- Length of stay in hospital
- Use of multiple antibiotics
- Urinary catheter
- Severity of illness
- Recent surgery
- Intravenous devices
- Surgical wounds
- Pressure sores
- Care in high risk areas such as intensive care units

Additional factors that increase the risk of an MRSA bacteraemia are:

- Immunosuppressed
- Diabetic
- Liver disease
- IV drug user
- Prosthesis
- Surgical wound
- Assisted ventilation
  - Current
  - Past 7 days

## What is the local situation?

For 2009/10 the Oxfordshire limit for MRSA bacteraemias was 39 (36 for ORH and 3 for NOC); to date (19/03/10) there were 31/39 cases within the Oxfordshire health economy. Of these 11 were PCO cases (pre 48 hour). For 2010/11 the MRSA will change to the new MRSA Objective of acute cases and Primary Care Organisation cases with a challenging limit of 26.

- 12 for ORH
- 13 for PCO
- 1 for NOC

In the past year the PCT has been chairing the PCO cases (number = 11). Analysis from these indicates the majority of cases occur via the **urinary tract, often through catheterisation of 'high risk' patients that are MRSA positive.** The majority of the patients with **MRSA bacteraemia via the urinary tract are also male.** Locally guidance is therefore being developed in conjunction with the ORH regarding antibiotic prophylaxis for high risk groups. A health economy continence project is also nearing completion to again help address this issue. Please look out for further information on these in the near future.

### Prevention of the Spread of MRSA

Always wash your hands after you have had any physical contact with a patient. Use soap and water and alcohol gels.

All antibiotic courses should be started for specific reasons, tailored to the narrowest effective therapy and stopped as soon as the patient's clinical condition allows. In particular, the use of cephalosporins and quinolones should be avoided where possible.

Use anti-bacterials for treatment and prophylaxis in accordance with PCT guidelines.

Environments should be kept clean at all times, including thorough cleaning of high risk equipment

### Monitoring of MRSA Bacteraemias

Reporting of MRSA bacteraemia by NHS trusts has been mandatory in England since April 2001, with enhanced reporting (e.g. patient-level data) introduced in October 2005. MRSA bacteraemias peaked in 2003/04 at just under 8000 cases in the NHS, resulting in the Department of Health setting challenging limits for all Trusts to reduce this by 50% by the end of 2007/08.

Monitoring of all acute Trusts (where presently the MRSA bacteraemia limit is held) is via the Health Protection Agency (HPA) mandatory reporting systems. This monitoring has been split into two groups:

- **Pre-48 hour cases** - patients are diagnosed with 48 hours of admission to hospital and are therefore deemed to have developed the infection from primary care.
- **Acute cases** - patients are diagnosed whilst in hospital (or 48 hours after discharge) and are therefore deemed to have developed the infection as an inpatient.

From April 2010 the Department of Health has split the monitoring into NHS acute and NHS Primary Care Organisations (PCO).

### Death of a patient from an MRSA Bacteraemia

The Department of Health expects any death of a patient with MRSA bacteraemia on part 1 of the death certificate to be treated as a Serious Untoward Incident (SUI). This involves a full investigation of the cause of developing the bacteraemia and will include all involved with the case, including primary care if it is a pre-48 hour case.

## Environmental Infection Control measures in Community hospitals, residential/care/nursing homes

- MRSA may be transmitted from patient to patient.
- Staff should pay rigorous attention to hand and environmental hygiene in order to reduce the spread of the organism.
- Isolation of patients who have MRSA is crucial in preventing the spread of MRSA and other infectious diseases. Patients should be isolated until successful decolonisation.
- Carers should use gloves and aprons when attending to patients in isolation and should wash their hands with soap and water in addition to using alcohol gel after every contact.
- Areas of the ward exposed to known MRSA contact should be terminally cleaned on discharge of a case.

## Environmental Infection Control measures in patients homes

- There are no special requirements in a patients home; MRSA does not usually affect a persons normal activities.
- MRSA is rarely a problem for healthy people including babies, children and pregnant women.
- Normal domestic cleaning is sufficient.
- Surfaces and floors should be cleaned/vacuumed regularly.
- Clothing, bedding etc. can be washed as normal in the family washing machine.
- Rubbish can go into the ordinary household waste.

## Differences between MRSA and *Clostridium difficile*

A previous [Prescribing Points 18.08 June 2009](#) has discussed *Clostridium difficile*.

MRSA	<i>C. difficile</i>
<ul style="list-style-type: none"> <li>• Transmitted mainly through contact with colonised skin or contaminated equipment</li> <li>• Eliminated from hands using alcohol handrub and cleaning with most disinfectants</li> <li>• Key risk of bloodstream infection is through piercing of skin (e.g. cannula, catheter or open wounds)</li> <li>• Survives less well in the environment</li> <li>• Screening for colonised patients is simple (nose and skin swab) and colonisation is known to increase risk of infection and transmission</li> <li>• Case definition is within 48 hours of discharge from or admission to hospital</li> </ul>	<ul style="list-style-type: none"> <li>• Transmitted mainly through contact with spores from infected faeces, or contact with contaminated equipment</li> <li>• Reduced by washing hands with soap and water and cleaning with chlorine based cleaning products (<u>not</u> affected by alcohol handrub)</li> <li>• Key risk of infection is through ingesting spores together with antibiotic treatment</li> <li>• Spores survives very well in the environment</li> <li>• Screening for colonised patients is inappropriate (most cases would not be identified and it requires a stool sample) colonisation without symptoms is not considered to increase risk of transmission</li> <li>• Case definition is within 72 hours of discharge from or admission to hospital</li> </ul>

