Draft guidance on treatment and prevention of MRSA

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New draft guidelines have been prepared on the treatment and prophylaxis of MRSA. This article outlines their content and discusses the development and management of this bacteria.

MRSA has received much media and political attention and its reduction is now an important goal. As NT’s ‘Keep It Clean’ campaign aims to show, infection control – especially the control of a resistant organism – is a complex issue with many contributing factors requiring a consistent approach to management (Shuttleworth, 2004).

Recent initiatives such as the Matron’s Charter have introduced a planned approach to many of the environmental issues involved in the spread of infection. The Specialist Advisory Committee on Antimicrobial Resistance has now added to this with new draft guidance (Curtis et al, 2005) that can provide a consistent approach to the treatment and prophylaxis of MRSA.

Resistance to antibiotics
Even while penicillin was being developed in the 1930s and 1940s it was predicted that bacteria would acquire resistance. Penicillin-resistant Staphylococcus aureus was soon isolated and by the 1950s penicillin resistant strains of the bacteria were common (Lawrence and May, 2003).

Since then antibiotic resistant strains of bacteria have continued to develop including, within a year of the introduction of meticillin (previously known as methicillin), meticillin-resistant Staphylococcus aureus (MRSA) and more recently vancomycin-resistant Staphylococcus aureus (Avison et al, 2002).

Drug resistance is a well-known problem in many infectious diseases. Bacteria can acquire resistance to antibiotics either by mutation or by gene transfer – where segments of DNA can jump from one DNA loop to another.

The resistance of MRSA to antibiotics is thought to have been acquired through gene transfer. Selection pressure in the environment then encourages resistance to spread as antibiotics kill off the susceptible bacteria leaving the resistant organisms to become dominant (Lawrence and May, 2003).

In the 1980s the highly transmissible epidemic MRSA (EMRSA) was isolated. Several strains of this organism have now been identified and the latest EMRSA-17 is more resistant than any strains previously noted (Aucken et al, 2002).

EMRSA appears to be able to survive and spread easily in a hospital. Therefore adherence to infection control policies are an important part of reduction and prevention measures.

In addition, treatment and prophylaxis medication decisions need to be mindful of bacterial resistance and evidence-based.

New guidance
The new guidance is based on evidence from a systematic review of the literature and a new survey of MRSA infections in UK hospitals.

The guidance is in line with most clinicians practice (NT, News, 10 May, p6) and recommends following the laboratory reports on susceptibility rather than always using newer antibiotics. Encouragingly, it reports that there is no shortage of agents effective against MRSA in the UK.

Treatment
The guidance includes recommendations for treatment in a variety of sites according to risk and severity of infection. In many cases it recommends the use of older antibiotics such as tetracyclines in skin and soft tissue infections unless the infection is severe enough to carry a high risk of bacteraemia or endocarditis, when glycopeptides or linezolid should be considered. In urinary infections caused by susceptible MRSA, trimethoprim or nitrofurantoin are alternative treatments.

Combination therapy is discussed, such as rifampicin and fusidic acid in skin and soft tissue infections or rifampicin and fluoroquinolones in bone and joint infection. However, recommendations are also made for more research into the use of combination therapies.

The document suggests that clear guidelines on the use of glycopeptides such as vancomycin are required. The review process identified useful recommendations from Belgium and these have been endorsed except for cases of surgical prophylaxis. Glycopeptides are suggested for empirical treatment of the following:

- Intravascular catheter infection in neonates;
- Patients with burns in units with a high preva-
lence of MRSA;
+ Severe catheter-related sepsis where the catheter cannot be removed and the patient is haemodynamically unstable;
+ Prosthetic valve endocarditis;
+ Foreign body or postsurgical meningitis with inconclusive investigation.

It is recommended that glycopeptides are not used for the following:
+ Mild or moderate Clostridium difficile colitis;
+ Prophylaxis of endocarditis except in high-risk patients with proven penicillin allergy;
+ Prophylaxis of catheter insertion in CAPD, haemodialysis or other intravenous catheters;
+ Within the first 96 hours of empirical treatment of neutropenic fever;
+ Isolation of coagulase-negative staphylococci from a single blood culture.

The guidance also recommends that in cases of bacteraemia, glycopeptides or linezolid should be used for at least 10 days. This should be longer in patients with or at risk of endocarditis where endocardiographic assessment is important.

It is suggested that wherever possible once antibiotic susceptibilities are known treatment should be stepped down from glycopeptides and linezolid to flucloxacillin.

### Prophylaxis

As part of the literature review process a thorough analysis was made both of old (pre-Medline) and new studies on the clearance of MRSA.

However, the usefulness of the information is limited by lack of standardisation of culture techniques and follow-up. The document highlights a Cochrane review (Loeb et al, 2004) that concluded there was insufficient evidence to support the use of topical or systemic antimicrobial therapy for eradicating nasal or extra-nasal MRSA.

However, this is routine practice in Scotland and has been shown as successful practice in another trial. The guidance therefore recommends that further research is required into this area of practice.

The recommendation for patients who require surgery and have a history of MRSA is that they should receive glycopeptide prophylaxis alone or in combination with other antibiotics active against other potential pathogens. This treatment may also be considered for patients who have come from facilities with a high prevalence of MRSA.

### The survey

The survey results used to inform these guidelines reveal interesting characteristics of MRSA infection. The figures suggest a higher susceptibility to MRSA among older people, with patients aged 60 or over forming 81.7 per cent of the positive population (Table 1). This figure is higher than predicted from figures of hospital inpatients and there is no evidence to suggest this is due to transfer of patients from residential/nursing homes to hospital.

It is interesting to note that in most cases MRSA infection is acquired in hospital (Table 2). Although the guidance does highlight that MRSA is appearing increasingly in the community setting. This mirrors the experience with penicillin-resistant staphylococci in the 1950s.

### References


This article has been double-blind peer-reviewed.

For related articles on this subject and links to relevant websites see www.nursingtimes.net

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**Table 1. Age of Patient**

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<th>Age</th>
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<td>4</td>
<td>1.3</td>
</tr>
<tr>
<td>20 – 39</td>
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<td>40 – 59</td>
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<td>60 – 79</td>
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<td>48.2</td>
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<tr>
<td>80 and over</td>
<td>104</td>
<td>33.7</td>
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**Table 2. How/Where was MRSA Acquired?**

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<th>What/Where</th>
<th>Number</th>
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<tbody>
<tr>
<td>In hospital in this admission</td>
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<tr>
<td>Likely to have been present but undetected</td>
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<tr>
<td>Previously known MRSA-positive</td>
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<tr>
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<tr>
<td>Not recorded</td>
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