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Contents

Version Number	Update
4.2	• Full content review • Chlorhexidine mouthwash no longer prescribed as part of MRSA decolonisation, section 6 • Addition of BORSA, section 1.4 • Addition of screening for inpatients undergoing invasive procedures, table, section 2.1
4.3	• Review date extended
4.4	• Full content review and additional information on management of BORSA

1. Carriage, Infection and clearance

1.1 Staphylococcus aureus

Staphylococcus aureus is particular type of bacteria that is carried persistently by about one third of normal healthy people and carried intermittently by about a further third. In addition, it is particularly likely to be carried by people with inflamed skin such as eczema.

Although it is found on normal healthy people it is also responsible for common infections such as boils and skin infections, or deeper infections such as septic arthritis and osteomyelitis. It is a particular problem in hospitals and healthcare as it is more likely to cause infection when there is a breach of normal body defences as with a surgical wound, IV cannula or urinary catheter.

1.1.1 Names and acronyms for *Staphylococcus aureus*

In healthcare the differences in susceptibility of *Staphylococcus aureus* to penicillin-type antibiotics has come to be important in the way they are referred to. Changes in testing methods and antibiotic names means that meanings of some of the terms, acronyms and abbreviations are not obvious.
Originally an antibiotic called methicillin (later re-named meticillin) was used to decide whether a *Staphylococcus aureus* strain was susceptible to flucloxacillin and other penicillin –type antibiotics. This led to the use of the terms MRSA for meticillin-resistant *Staphylococcus aureus* and MSSA for meticillin-susceptible *Staphylococcus aureus*. MRSA strains generally have high levels of resistance to these antibiotics.
Currently an antibiotic called oxacillin has replaced meticillin in the testing process and more recently strains of *Staphylococcus aureus* which have reduced susceptibility without the high level resistance associated with MRSA strains. These are being referred to as BORSA – borderline oxacillin resistant *Staphylococcus aureus*.
As MRSA strains and BORSA strains are more difficult to treat than susceptible MSSA strains and because transmission of these strains occurs in a hospital and healthcare setting transmission based precautions are appropriate to reduce infection risk to patients. However specialised laboratory culture media of the type used for screening for MRSA have not been developed to screen for BORSA and so a similar admission screening process is not feasible.

1.1.2 Carriage sites

For all Staphylococus strains MSSA, MRSA and BORSA, the nose is the most common site of carriage with perineum and throat being other common sites.

Staphylococcus aureus including MRSA is also likely to be carried on areas of inflamed skin such as eczema / dermatitis and any wounds such as leg ulcers and pressure sores.

In addition, the presence of a medical device which breaches the normal body defences such as peripheral venous cannulae or urinary catheters will predispose to *Staphylococcus aureus* carriage at that site.

1.2 Infection

As distinct from carriage, infection implies an invasive process to a greater or lesser degree and some degree of tissue inflammation. The common infections caused by *Staphylococcus aureus* including MRSA are skin infections such as boils and impetigo, cellulitis, osteomyelitis and infective endocarditis. In the healthcare setting *Staphylococcus aureus* often cause infection related to medical devices such as IV lines.

1.3 Clearance

Staphylococcus aureus carriage is normal for many people but in healthcare it can be useful to attempt to clear carriage with topical antimicrobials (Decolonisation therapy). Patients colonised with MRSA and BORSA should normally be prescribed decolonisation therapy unless there is a clear indication not to. Sometimes people who were carriers of MRSA may lose carriage spontaneously, especially where the only site of carriage was a wound that has healed; or following decolonisation therapy.

For the purposes of infection control management, previously MRSA colonised patients can be regarded as clear if they have **three clear screens from all appropriate sites** taken **at least one week apart** and while not receiving topical or systemic antibiotic therapy that would suppress the growth in culture.

1.3.1 Detection in specimens

Staphylococcus aureus strains are usually detected by culture from specimens such as swabs taken from clinically infected sites. In addition, the presence of *Staphylococcus aureus* strains in carriage

sites such as the nose can be detected by culture usually aided by a selective growth medium in the laboratory. As most concern has been related to MRSA laboratory culture media have been produced which make detection of these strains straightforward. No culture media have been developed to simplify detection of BORSA, so these strains are detected by culturing for *Staphylococcus aureus* in general and then doing susceptibility testing on whatever grows, which is more laboratory work.

2. Admission MRSA Screening Process

National policy directs a clinical risk assessment for MRSA carriage.

MRSA screening consists of:

- The identification of patients at higher risk of MRSA colonisation by clinical risk assessment (CRA)
- Obtaining samples from sites of usual MRSA carriage to detect carriage including urine and wounds where appropriate.

2.1 Screening process by patient group

Patient group	Process
All adult emergency admissions except maternity and mental health (including transfers from hospitals outside NHS Borders)	1. CRA 2. MRSA screening samples
All adult elective admissions with at least overnight stay anticipated	1. CRA 2. MRSA screening samples – if not performed for the admission in pre-assessment (See section 2.4)
All admissions to ward 9 (orthopaedics) regardless of whether patient will have an overnight stay	1. CRA 2. MRSA screening samples – if not performed for the admission in pre-assessment (See section 2.4)
All admissions and transfers to ITU	1. CRA 2. MRSA screening samples
Patients transferred to paediatrics from another hospital	MRSA screening samples
Patients transferred to maternity from another hospital	MRSA screening samples
Paediatric admissions other than transfers from another hospital	Not screened
Admissions to mental health	Not screened

Admissions to community hospitals	Not screened
Day case surgery	Screening not normally required
Inpatients with prolonged admissions (>2 weeks) undergoing invasive procedures	MRSA screening samples taken a few days prior to procedure.

2.2 The clinical risk assessment (CRA)

Obtain answers to the 3 CRA questions:

1. Has the patient previously been identified as MRSA positive (ask the patient and check for flag on TrakCare)

2. Is the patient currently resident in a care home, institutional setting or transferred from another hospital?

3. Does the patient have a wound or device present e.g. Leg Ulcer, Pressure Sore, Hickman Line, PVC, urinary or supra-pubic catheter?

If the answer is yes to any of these questions assume the patient to be MRSA positive and manage accordingly pending the results of MRSA screening samples.

2.3 MRSA screening samples

These are taken from all patients admitted to acute adult wards except maternity, and all paediatric and adult transfers from other hospitals.

Sites to be included in an MRSA screen:

- Nose swab (both anterior nares sampled using one swab)
- Perineum swab
- Throat swab (if patient will not accept perineal sampling or this is impractical for other reasons)
- Wound swab(s)
- Urine if patient is catheterised when admitted
- Site of any percutaneous device (e.g. PEG, supra-pubic catheter)
- Sputum if the patient is expectorating

(See also NHS Education for Scotland (NES) HAI Quick Reference Screening guide)

2.4 MRSA screening in pre-admission clinic

Patients attending the pre-admission clinic for procedures that will require at least an overnight stay will be screened for MRSA using the CRA and MRSA screening samples. All patients attending the pre-admission clinic for orthopaedic procedures with admission to Ward 9 should be screened for MRSA using the CRA and MRSA screening samples regardless of length of anticipated stay.

Patients with negative MRSA screening samples but with a 'YES' answer to one of the CRA questions are considered at higher risk of MRSA acquisition. Therefore the time period for which the assessment would be considered valid for these patients is shorter than for those patients with 'NO' answers to all CRA questions and negative MRSA screening samples.

	Period of validity after which screening should be repeated.
Pre admission patient with negative MRSA screening samples and 'NO' answers to all CRA questions	18 weeks
Pre admission patient with negative MRSA screening samples and a 'YES' answer to a CRA question.	8 weeks

The CRA questions should be repeated on the booked admission to hospital and further samples taken if the answer to any is 'yes'.

2.5 Management of colonised patients undergoing elective surgery

Colonised patients undergoing elective surgery should be offered decolonisation therapy applied either pre-operatively or peri-operatively (preferred option). Peri-operative decolonisation should be commenced two or three days prior to the date of surgery in order to effectively suppress microbial load and reduce the risk of infection.

If antimicrobial prophylaxis is needed for the procedure this should be adjusted to include cover for MRSA as specified in the NHS Borders Antimicrobial Guidelines for hospitals.

3. Other MRSA, BORSA and *Staphylococcus aureus* screening

Screening patients for carriage of MRSA, BORSA and other *Staphylococcus aureus* may be appropriate in some circumstances. e.g following isolation of BORSA identified from a clinical sample, to detect carriage of certain *Staphylococcus aureus* strains. Such screening would usually be as directed by microbiology or the IPCT. Some specialist units e.g. dialysis, may have separately agreed protocols.

As no Trakcare request exists for such screens these should be requested with 'MSSA screen' or 'BORSA screen' in the clinical details.

4. Staff screening

This is very seldom necessary but may be useful when unexplained acquisition of MRSA occurs within NHS Borders patients and personnel. The decision to screen will be agreed with senior medical and nursing staff within the involved division. The process will be co-ordinated by Occupational Health and the Infection Prevention Control Team. Staff found to be MRSA positive will be seen and counselled by a member of Occupational Health staff. The appropriate decolonisation treatment will be prescribed and provided, and follow up screening organised.

Occupational Health will advise when it is appropriate to return to work.

5. Management of MRSA/BORSA colonised patients in inpatient areas in BGH and Community Hospitals (excluding mental health)

General Measures

5.1 Hand hygiene

Hand hygiene (either hand washing or application of alcohol gel) is the single most important measure for prevention of transmission of MRSA/BORSA in clinical settings.

Please refer to the National Infection Prevention and Control Manual and NHS Borders Zero Tolerance Hand Hygiene Policy.

5.2 Placement

Patients colonised with MRSA/BORSA should be nursed in a single room. The room should be identified as one being used for isolation and the door remain closed unless risk assessment shows that this compromises patient care. Any such assessment should be documented in the unitary record.

Appropriate infection control precautions should be clearly identified using correct contact precautions signage.

If single room with appropriate infection control precautions is not available, colonised patients may be managed within a bay on advice from the Infection Prevention and Control Team (IPCT).

5.3 Trakcare alert of newly identified MRSA/BORSA positive patients

The Infection Control Team will flag newly identified MRSA positive patients with an electronic alert on Trakcare.

5.4 Contact screening of newly identified cases of MRSA/BORSA colonisation

Identification of MRSA/BORSA colonisation or infection in patients some time following admission will often imply transmission within the ward. It may then be appropriate to screen contacts of the index case to prevent further transmission within the ward. When new cases such as these are identified the need for contact screening will be considered by the IPCT in discussion with ward staff.

5.5 Decolonisation of the MRSA/BORSA positive patient

The usual approach should be to use topical decolonisation on patients colonised with MRSA who are admitted to hospital as this appears to reduce the risk of MRSA infection during their admission. There may be factors such as skin sensitivity or multiple wounds which would make it less applicable in a particular patient.

An attempt should be made to decolonise patients known to be positive with MRSA. Please remember that, as with any other procedure in hospital, any proposed investigation or treatment should be adequately explained and discussed with the patient and/ or their relatives, and that they have the right to decline such intervention.

5.6 Informing a patient that they are colonised with MRSA/BORSA

In the first instance this should be undertaken by a member of the Medical/ Nursing staff caring for the patient. However, after this the IPCT are happy to speak to patients/ relatives if this is deemed appropriate or further questions/ help is required.

Relatives should only be informed with the agreement/ knowledge of the patient. For children, the parents/ guardian will be informed.
Colonised patients and where appropriate, their relatives/carers, should be offered written information on MRSA.

5.7 Transfer to another ward within the hospital

Transfer of MRSA affected patients to other wards should be minimised to reduce the risk of spread, but this should not compromise other aspects of the patient's care, such as rehabilitation. In all cases, it is the responsibility of ward and clinical staff to inform relevant departments of a patient's MRSA status well in advance of transfer.

Specific measures

5.8 Personal protective equipment (PPE)

Glove and apron (disposable) must be worn by all staff in contact with patient. Gloves and apron must be removed before leaving the patient surroundings. Wearing gloves does not preclude the need for hand washing.

Masks and eye protection should be worn if procedures are to be undertaken in which there is judged to be a significant risk of splashing of blood/body fluids or when the patient is unable to control cough and sputum is colonised.

5.9 Visitors

Visitors should be advised to follow instructions on the precautions signage.

5.10 Crockery and cutlery

Use normal utensils. Wash in dishwasher.

5.11 Linen

Treat as infected. For personal laundry follow any local arrangements in place. See 'Washing Clothes at Home' leaflet. Change linen and clothing on a daily basis.

5.12 Waste

Waste should be treated as clinical waste i.e. placed in an appropriate clinical waste bag as described in the National Infection Prevention and Control Manual.

5.13 Equipment

Decontaminate all patient equipment with Tristel Fuse or appropriately diluted Actichlor Plus solution (not routinely used by NHS Borders).

5.14 Fans

Portable fans should not be used close to a patient known to be MRSA positive.

5.15 Slings

Single patient use slings should be used.

5.16 Other equipment

Items of healthcare equipment in direct contact with the patient (e.g. stethoscopes, BP cuffs) should, where possible, be dedicated for that patient during their hospital stay. Such items should be appropriately decontaminated or disposed of after the patient is discharged.
Decontaminate all equipment with Tristel Fuse or appropriately diluted Actichlor Plus (not routinely used by NHS Borders).

Cleaning

5.17 Routine and Terminal cleaning

The patient's furniture, floors and touch surfaces should be cleaned with Tristel Fuse solution or appropriately diluted Actichlor Plus (not routinely used by NHS Borders).

Ensure laundering of curtains during terminal clean.

6. Transfer, discharge and movement of MRSA/BORSA colonised and infected patients to theatre, diagnostic areas and outpatients.

MRSA infection / colonisation should not interfere with the management of the patient. When visiting a diagnostic or therapeutic department, the department must be informed, in advance, so that appropriate infection control measures can be implemented.

6.1 Diagnostic Investigations, Theatre and DPU

Staff of the receiving department should be made aware of the patient's MRSA status, so that infection control measures for that department can be implemented.

Occlude any lesions whenever possible with an appropriate dressing.

Chairs/trolleys should be decontaminated with Tristel Fuse or appropriately diluted Actichlor Plus (not routinely used by NHS Borders) after transfer or use. If a patient is being transferred on their bed, both bed and linen should be cleaned prior to transfer.

Patient should spend the minimum time in the department, being sent for when the department is ready and not left in a waiting area with other patients.

Equipment and the number of staff attending should be kept to a minimum.

Surfaces with which the patient has had direct contact should be decontaminated with Tristel Fuse or appropriately diluted Actichlor Plus (not routinely used by NHS Borders).

MRSA colonised patients do not need to be placed at the end of a theatre list and can be recovered in the main recovery areas.

6.2 Discharge of MRSA and BORSA colonised patients

The General Practitioner and other health care agencies, including Ambulance Services, involved in the patient's care should be informed of MRSA colonisation. NB. All ambulance services have their own MRSA policies.

The ward nurses should inform community nurses where ongoing care is required.

MRSA/BORSA carriers will not normally require special treatment after discharge from hospital. Advice may be obtained from the IPCT if patients due for transfer or discharge are undergoing topical decolonisation therapy.

Patients and their carers should be fully informed about their MRSA status prior to discharge and reassured that their healthy relatives and contacts are not at risk. Advice may be sought from the Infection Prevention & Control Team if patients or their carers identify contacts that may be at risk due to their own health, e.g. contacts with lowered immunity or chronic skin lesions.

Patients should be advised that they should inform staff at any future hospital admission that they have previously been identified as a carrier of MRSA/BORSA.

Patients who have died colonised or infected with MRSA/BORSA do not require to be placed in body bags for this reason as they do not pose a risk to mortuary staff, patients, relatives, or undertakers.

6.3 Outpatients

Colonised patients attending out-patient appointments should attend as normal and not segregated. Gloves and aprons should be worn by staff if performing a clinical examination.

7. *Staphylococcus aureus* (including MRSA and BORSA) Decolonisation Treatment

Decolonisation treatment will last 5 days. It will normally be applied to inpatients at BGH found to be colonised with MRSA and BORSA, usually at the direction of the IPCT, but may also be initiated by the inpatient team. Other agreed protocols may exist for certain patient groups e.g. elective arthroplasty and dialysis patients. Normally a maximum of only two consecutive treatments will be given in a particular admission, but contact IPCT for advice.

7.1 Topical decolonisation treatment

1. Apply Mupirocin (Bactroban) nasal ointment three times a day to the inner surface of the nostrils (use a cotton wool bud to enhance application). If the patient's MRSA strain is resistant to mupirocin, alternative treatment will be discussed with ward staff by IPCT

2. Apply daily 4% Chlorhexidine cleansing solution instead of soap. Rinse off and towel dry

3. Chlorhexidine cleanser should also be used twice weekly as a shampoo whilst on the decolonisation treatment (hair conditioner may be used for the final rinse)

4. Alternative treatments are available for patients whose skin cannot tolerate chlorhexidine, for further information contact the IPCT

5. The patient's bed linen (and night wear if possible) should be changed daily during the decolonisation treatment.

7.2 Post-decolonisation screening

- This should be commenced no sooner than 48 hours after the treatment regime has been completed

- If patient commences or remains on antibiotic treatment active against MRSA, delay screening until 48 hours after antibiotics have been discontinued

- Mark specimen 'MRSA clearance screening'

- If any screen is positive, consult the IPCT who will reassess the need for further treatment.

For the purposes of infection control management, previously MRSA colonised patients can be regarded as clear if they have **three clear screens from all appropriate sites taken at least one week apart** and while **not** receiving topical or systemic antibiotic therapy that would suppress the growth in culture. No criteria are given for clearance of BORSA or MSSA

A negative screen following decolonisation does not guarantee that the patient will not recolonise at a later date. The patient record on Trakcare will continue to alert of the history of MRSA carriage.

Appendix 1: Protocol for Clinical Risk Assessment (CRA) for MRSA Screening

Responsibility

Completion of the CRA is part of the nursing admission/booking process. Sample collection is the responsibility of the staff member admitting the patient to the ward. The CRA is in the Adult Inpatient Record under Rapid Risk Assessment.

Clinical Risk Assessment (CRA)

For every patient the answer to 3 questions should be sought.

1. **Has the patient any previous history of MRSA colonisation or MRSA infection at any time in the past?** (Check case notes and TrakCare for clinical alerts and TrakCare / Lab System for results).

2. **Is the patient currently resident in a care home or institutional setting, or transferred from another hospital?**

3. **Does the patient have a wound/ulcer or invasive device which was present before admission to this hospital?** (Any wounds, skin breaks or sites of invasive devices should be sampled on separate swabs. Patients with indwelling urinary catheters should also have a urine sample taken for MRSA testing).

Regardless of the CRA results, the patient is then screened for MRSA by taking a NASAL & PERINEAL swab (and other samples as required i.e. catheter urine; wound swab etc). Label and send all samples to Microbiology for processing.

If there are **exceptional clinical** reasons for not taking a **perineal swab**, a **throat swab** can be substituted, (**NOT a groin swab**), but the reason must be recorded in the patient case notes as the diagnostic effectiveness is significantly lowered.

After administering the CRA, the patient will be in one of two categories:

1. "NO" to all 3 questions - low risk of MRSA colonisation, therefore maybe managed on an open ward.

2. **"YES" to any of the 3 questions - manage patient placement as if MRSA positive, with pre-emptive action taken to minimise risk of transmission of MRSA e.g.**:-

Patient isolated in single room

Patient managed in open ward (risk assessed)