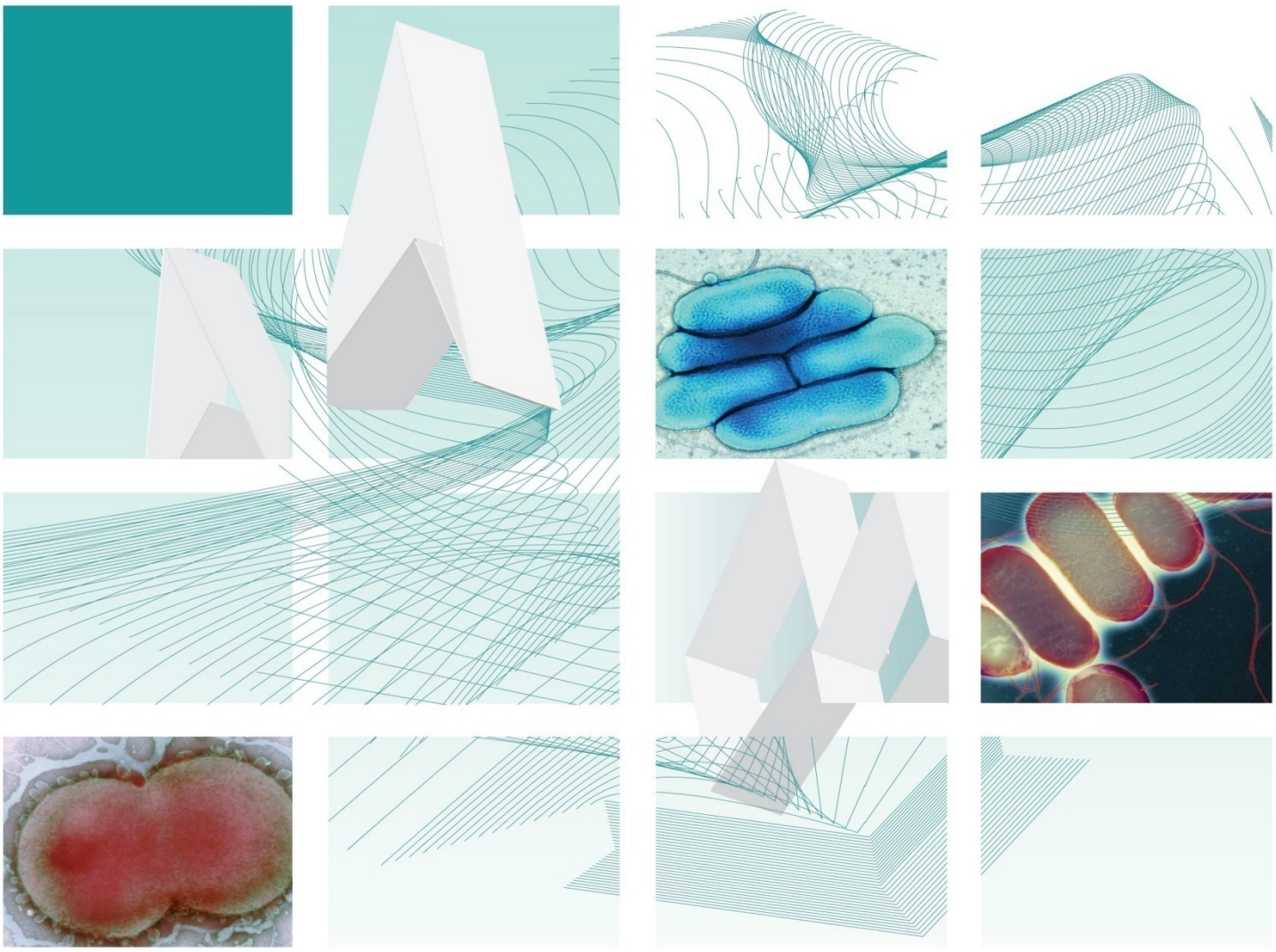
Public Health England

NHS

UK Standards for Microbiology Investigations

Investigation of Specimens for Screening for MRSA



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Issued by the Standards Unit, Microbiology Services, PHE

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Acknowledgments

UK Standards for Microbiology Investigations (SMIs) are developed under the auspices of Public Health England (PHE) working in partnership with the National Health Service (NHS), Public Health Wales and with the professional organisations whose logos are displayed below and listed on the website http://www.hpa.org.uk/SMI/Partnerships. SMIs are developed, reviewed and revised by various working groups which are overseen by a steering committee (see http://www.hpa.org.uk/SMI/WorkingGroups).

The contributions of many individuals in clinical, specialist and reference laboratories who have provided information and comments during the development of this document are acknowledged. We are grateful to the Medical Editors for editing the medical content.

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UK Standards for Microbiology Investigations are produced in association with:

Contents

Amendment Table

Each SMI method has an individual record of amendments. The current amendments are listed on this page. The amendment history is available from standards@phe.gov.uk.

New or revised documents should be controlled within the laboratory in accordance with the local quality management system.

Amendment No/Date.	8/03.04.14
Issue no. discarded.	5.2
Insert Issue no.	6
Section(s) involved	**Amendment**
Whole document.	Document has been transferred to a new template to reflect the Health Protection Agency's transition to Public Health England. Front page has been redesigned. Status page has been renamed as Scope and Purpose and updated as appropriate. Professional body logos have been reviewed and updated. Standard safety and notification references have been reviewed and updated.
Introduction.	Introduction has been restructured to aid flow. Livestock MRSA has been inserted. Strength of enrichment broth recommended changed from 7% to 2.5%.
Appendix.	Old Appendix 1 deleted. Old Appendix 2 has become Appendix 1 with a link replacing the table. Old Appendix 3 has become Appendix 2.
References.	References reviewed and updated.

Amendment No/Date.	7/12.07.12
Issue no. discarded.	5.1
Insert Issue no.	5.2
Section(s) involved	**Amendment**

Whole document.	Document presented in a new format. The term “CE marked leak proof container” replaces “sterile leak proof container” (where appropriate) and is referenced to specific text in the EU in vitro Diagnostic Medical Devices Directive (98/79/EC Annex 1 B 2.1) and to Directive itself EC[1,2]. Edited for clarity. Reorganisation of [some] text. Minor textual changes.
Sections on specimen collection, transport, storage and processing.	Reorganised. Previous numbering changed.
References.	Some references updated.

UK SMI[#]: Scope and Purpose

Users of SMIs

Primarily, SMIs are intended as a general resource for practising professionals operating in the field of laboratory medicine and infection specialties in the UK. SMIs also provide clinicians with information about the available test repertoire and the standard of laboratory services they should expect for the investigation of infection in their patients, as well as providing information that aids the electronic ordering of appropriate tests. The documents also provide commissioners of healthcare services with the appropriateness and standard of microbiology investigations they should be seeking as part of the clinical and public health care package for their population.

Background to SMIs

SMIs comprise a collection of recommended algorithms and procedures covering all stages of the investigative process in microbiology from the pre-analytical (clinical syndrome) stage to the analytical (laboratory testing) and post analytical (result interpretation and reporting) stages. Syndromic algorithms are supported by more detailed documents containing advice on the investigation of specific diseases and infections. Guidance notes cover the clinical background, differential diagnosis, and appropriate investigation of particular clinical conditions. Quality guidance notes describe laboratory processes which underpin quality, for example assay validation.

Standardisation of the diagnostic process through the application of SMIs helps to assure the equivalence of investigation strategies in different laboratories across the UK and is essential for public health surveillance, research and development activities.

Equal Partnership Working

SMIs are developed in equal partnership with PHE, NHS, Royal College of Pathologists and professional societies. The list of participating societies may be found at http://www.hpa.org.uk/SMI/Partnerships. Inclusion of a logo in an SMI indicates participation of the society in equal partnership and support for the objectives and process of preparing SMIs. Nominees of professional societies are members of the Steering Committee and Working Groups which develop SMIs. The views of nominees cannot be rigorously representative of the members of their nominating organisations nor the corporate views of their organisations. Nominees act as a conduit for two way reporting and dialogue. Representative views are sought through the consultation process. SMIs are developed, reviewed and updated through a wide consultation process.

Quality Assurance

NICE has accredited the process used by the SMI Working Groups to produce SMIs. The accreditation is applicable to all guidance produced since October 2009. The process for the development of SMIs is certified to ISO 9001:2008. SMIs represent a good standard of practice to which all clinical and public health microbiology laboratories in the UK are expected to work. SMIs are NICE accredited and represent

[#]Microbiology is used as a generic term to include the two GMC-recognised specialties of Medical Microbiology (which includes Bacteriology, Mycology and Parasitology) and Medical Virology.

neither minimum standards of practice nor the highest level of complex laboratory investigation possible. In using SMIs, laboratories should take account of local requirements and undertake additional investigations where appropriate. SMIs help laboratories to meet accreditation requirements by promoting high quality practices which are auditable. SMIs also provide a reference point for method development. The performance of SMIs depends on competent staff and appropriate quality reagents and equipment. Laboratories should ensure that all commercial and in-house tests have been validated and shown to be fit for purpose. Laboratories should participate in external quality assessment schemes and undertake relevant internal quality control procedures.

Patient and Public Involvement

The SMI Working Groups are committed to patient and public involvement in the development of SMIs. By involving the public, health professionals, scientists and voluntary organisations the resulting SMI will be robust and meet the needs of the user. An opportunity is given to members of the public to contribute to consultations through our open access website.

Information Governance and Equality

PHE is a Caldicott compliant organisation. It seeks to take every possible precaution to prevent unauthorised disclosure of patient details and to ensure that patient-related records are kept under secure conditions. The development of SMIs are subject to PHE Equality objectives http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317133470313.

The SMI Working Groups are committed to achieving the equality objectives by effective consultation with members of the public, partners, stakeholders and specialist interest groups.

Legal Statement

Whilst every care has been taken in the preparation of SMIs, PHE and any supporting organisation, shall, to the greatest extent possible under any applicable law, exclude liability for all losses, costs, claims, damages or expenses arising out of or connected with the use of an SMI or any information contained therein. If alterations are made to an SMI, it must be made clear where and by whom such changes have been made.

The evidence base and microbial taxonomy for the SMI is as complete as possible at the time of issue. Any omissions and new material will be considered at the next review. These standards can only be superseded by revisions of the standard, legislative action, or by NICE accredited guidance.

SMIs are Crown copyright which should be acknowledged where appropriate.

Suggested Citation for this Document

Public Health England. (2014). Investigation of Specimens for Screening for MRSA. UK Standards for Microbiology Investigations. B 29 Issue 6. http://www.hpa.org.uk/SMI/pdf

Scope of Document

Type of Specimen

MRSA screening specimens

Scope

This UK Standard for Microbiology Investigation (SMI) describes the processing of screening human specimens to detect meticillin resistant *Staphylococcus aureus* (MRSA).

This SMI should be used in conjunction with other SMIs. Of particular relevance are the SMIs on www.hpa.org.uk/SMI/pdf/Bacteriology.

Guidelines for the control of MRSA in healthcare facilities have been produced by a working party of the Healthcare Infection Society (HIS), the British Society for Antimicrobial Chemotherapy (BSAC) and the Infection Control Nurses Association (ICNA)[3]. These guidelines recommend a risk assessment approach and advise Infection Control Committees to adapt them locally when designing infection control policies. Other recommendations have been published by the Scottish Infection Standards and Strategy Group (SISSG)[4], and the Department of Health (DH)[5].

Note: In this document “meticillin” has been used in place of the established “methicillin” in accordance with the current International Pharmacopoeia guidelines.

Introduction

Meticillin was the first penicillinase resistant penicillin and has been widely used in testing susceptibility of *S. aureus* to penicillinase resistant β-lactam agents. Hence, despite the fact that meticillin is no longer available and oxacillin and cefoxitin have replaced it for susceptibility testing, resistant strains are commonly known as MRSA. However, MRSA may also be referred to as oxacillin resistant *S. aureus* (ORSA).

MRSA strains are a continuing and increasing problem in healthcare settings, with outbreaks now occurring in the community. Screening for MRSA provides a means of identifying patients and staff who may be at risk of infection and/or involved in transmission of the organism.

In order to achieve the most effective use of finite hospital resources and to minimise morbidity due to these organisms it is usual to have a policy of planned screening to guide control measures to protect patients from MRSA colonisation and infection. Precisely what patient and staff screening is performed will depend on the endemicity of the problem and the case mix of the unit. If MRSA is highly endemic, with constant challenges to the provider units, then a risk assessment process is recommended. One approach is to concentrate on patients at greatest risk. Screening may also be appropriate in areas with low patient risk, particularly so where there is extensive interaction and transfer of patients with MRSA among wards or to acute care wards. Recommendations have been published by the Working Party of the Healthcare Infection Society, the British Society for Antimicrobial Chemotherapy and the Infection Control Nurses Association, the Scottish Infection Standards and Strategy Group, and the Department of Health[3-5]. Local Infection Control Committees may adapt these guidelines to their local situation.

Emergence and Prevalence of Meticillin Resistant Strains of *S. aureus*

MRSA were first described in the 1960s[6]. During the late 1970s and early 1980s, strains of *S*. *aureus* resistant to multiple antibiotics including meticillin and gentamicin were increasingly responsible for outbreaks of hospital infection worldwide and several clonal types have shown extensive international spread[7,8,9].

In England and Wales the spread of MRSA was well controlled until the 1990s. Between 1989 and 1991 only 1.6% of *S. aureus* bacteraemia isolates were meticillin resistant[10]. However, meticillin resistance rates increased steadily throughout the 1990s, there were also significant increases in the percentages of isolates resistant to erythromycin, clindamycin, ciprofloxacin, gentamicin, trimethoprim and rifampicin[11]. MRSA reached in excess of 40% in several regions in 2001 which triggered the introduction of mandatory surveillance of MRSA bacteraemia[12]. In 2005 trusts were tasked with reducing the number of cases of MRSA and since that time cases have fallen[13,14].

Healthcare-associated infections with MRSA are now posing a major threat to patients admitted to many hospitals in the UK. The cause of the dramatic rise in MRSA infections in the UK is probably multifactorial. The prevalent strains have a particular ability to spread. This may also be related to changed hospital practice with more inter-ward transfersand low staffing levels on some wards[15]. In addition, there is now a significant reservoir of patients with MRSA in the community and in some nursing homes throughout the country. Most studies indicate that infections with MRSA tend to occur in addition to the background rate which might be expected due to meticillin sensitive *Staphylococcus aureus* (MSSA) meaning that the overall number of cases have increased[16].

To date, 5 pandemic lineages of Hospital Acquired - MRSA have been reported in addition to various community-acquired (CA) - and Livestock-associated (LA) MRSA clones. These lineages are defined according to internationally agreed nomenclature based on sequence based typing (MLST) and their Staphylococcal Chromosomal Casette (SCC*mec*) type (see http://www.hpa.org.uk/web/HPAweb&HPAwebStandard/HPAweb_C/1284475013224).

Most MRSA infections are healthcare-associated, but an increasing number of infections are community-acquired, with patients having no established risk factors for acquisition of MRSA. While infections with community-acquired MRSA (CA-MRSA) and Livestock-acquired MRSA (LA-MRSA) are usually mild, they can be severe. Presence of the Panton-Valentine leucocidin (PVL) is common among CA-MRSA and more severe infection with CA-MRSA is mainly related to production of PVL. CA-MRSA isolates are often resistant only to β-lactam antibiotics[17,18].

Infection Risks

Studies have shown that the majority of patients from whom MRSA strains are isolated are colonised rather than infected with the organism[19]. Factors predisposing to superficial colonisation include procedures involving “hands on” care especially in acute surgical, renal dialysis and critical care units[20]. The risk of colonisation resulting in infection is increased in the presence of any breach in the skin, such as surgical wounds and devices penetrating the skin, eg prostheses and catheters, which provide a portal of entry for bacteria[20]. MRSA and MSSA are similar in virulence and this is

often connected to mobile genetic elements the presence or absence of which determines the clinical outcome[21].

Eradication of nasal carriage of *S. aureus* may be beneficial in certain clinical conditions such as recurrent furunculosis. Systemic, in addition to topical, treatment is appropriate for nasally colonised patients who have infection elsewhere. Topical antibacterial agents such as mupirocin and chlorhexidine/neomycin are preferred to systemic formulations when a patient is identified as a carrier.

Mechanisms of Resistance

Intrinsic resistance to β-lactams in clinical strains of *S. aureus* is often heterogeneous[22]. High-level resistance is expressed by a minority of cells on ordinary media at 37°C but more uniformly in hypertonic media or at 30°C[23,24]. Although most MRSA produce a β-lactamase, this is not responsible for their resistance to meticillin. Classical MRSA contain the *mecA* gene and this is the essential determinant of meticillin resistance. *MecA* is a 2,130-bp segment of DNA coding for a penicillin-binding protein (PBP2' or PBP2a) characterised by a low affinity for most β-lactams, and which is thought to take over the functions of all other PBPs when they are saturated by meticillin or other β-lactam antibiotics. MSSA do not produce this protein and their DNA will not hybridise with a probe specific for the *mecA* gene. The genetic determinant of PBP2a is transcribed in all MRSA cells and all phenotypic classes of MRSA, but additional factors affect the expression of meticillin-resistance.

The *mecA* gene is part of a mobile genetic element, the SCC*mec*, which is incorporated in the chromosome[25]. Eleven distinct types of SCC*mec*, designated I to XI have been described to date[26-28]. Most hospital-acquired MRSA harbour types I, II or III whereas most CA-MRSA harbour types IV or V, although EMRSA-15 encode type IV[29].

More recently, a *mec*A homologue which shows only 69% homology with *mec*A has been described. Originally designated *mecA*$_{LGA251}$, the gene is now known as *mec*C. The gene is carried in a newly identified mobile element known as SCC*mec*XI which has been identified in MRSA from humans and livestock.

The presence of the *mecA* gene an oxacillin, meticillin or cefoxitin MIC as recommended by BSAC or NCCLS are accepted criteria for meticillin resistance.

Borderline resistance

Some strains of *Staphylococcus aureus* may be encountered which are *mec*A negative but which exhibit a borderline resistance. Some of these strains have been found to be *mec*C positive (see above). This may be due to hyperproduction of β-lactamase (particularly obvious when testing oxacillin susceptibility) or alteration of PBPs[30]. There is some evidence from animal models that hyperproduction of β-lactamase is not clinically significant, but further data on virulence and effectiveness of therapy of patients infected with borderline resistant strains are needed to determine whether control measures are warranted[31,32].

Multiple drug resistance

The most prevalent Epidemic MRSA strains in the UK remain susceptible to several antibiotics including the glycopeptides vancomycin and teicoplanin (see Appendix 1). However, MRSA strains showing reduced susceptibility to vancomycin have been described[33]. This eventuality should be considered in any patient with MRSA in whom

there is an apparent treatment failure with a glycopeptide antibiotic[34]. Some strains now demonstrate resistance to as many as 20 antimicrobial compounds, including antiseptics and disinfectants and this trend in acquisition of extra resistances appears to be increasing[22]. Despite this there are several agents that are appropriate for the treatment of MRSA infections and new agents are being developed and introduced[34].

Methods of Screening for MRSA

Ideally, a screening method should allow the growth of all MRSA, inhibit or differentiate other organisms, and allow direct identification tests to be performed on colonies. Unfortunately some of these requirements conflict and a compromise is necessary.

Conventional methods used for screening should detect strains of MRSA by inhibiting contaminants and selecting *S. aureus* strains which are meticillin resistant. Direct plating on selective medium has the advantage that results may be available within 24hr, but most studies indicate that direct plating is less sensitive than broth enrichment followed by plating on solid media[35]. Whether this is the case with more recently developed chromogenic media remains to be determined. Sodium chloride, antibiotics and other selective agents may be added to the media to reduce contamination. Although this might inhibit *S. aureus* strains, and oxacillin or cefoxitin added to select meticillin resistant strains[36,37].

Enrichment broth containing 7% NaCl may inhibit the growth of some isolates of MRSA if present in small numbers[38]. For this reason 2.5% NaCl is recommended in this document which has been shown to work well when sub culturing to chromogenic agar[39].

Mannitol Salt Agar (MSA) and variations of MSA have been widely used, but have the disadvantage that direct agglutination tests for identification of *S. aureus* on MSA are unreliable or growth of MRSA is slow. Baird-Parker Media (BPC) has been used where the majority of MRSA are known to be ciprofloxacin resistant and, although ciprofloxacin susceptible MRSA will be missed when screening with this medium, the isolation rate with BPC has been reported to be higher than with MSA. The HIS/BSAC/ICNA working party and other reports consistently show chromogenic media to perform well although some require a longer incubation period than others and confirmation from this media via latex agglutination cannot be relied upon[35,40,41].

A significant limitation of all culture based screening methods is the dependency on growth of colonies. The value of screening would be greater if results were available more rapidly, and there is a clear need to develop rapid screening strategies. Molecular techniques for the detection of *mecA* for determining resistance are becoming established but the methods are still expensive when compared to culture. However, the clinical benefits for knowing the result sooner may outweigh this cost[42,43]. Molecular methods for the detection of *S. aureus* and the *mecA* gene are available[35]. Direct identification of MRSA on screening swabs by molecular methods that links identification of MRSA with the presence of *mecA* has been described and is commercially available. Evaluations indicate good performance and results in 2-3hr even using in house methods[42]. Variations in the conserved regions of the SCCmec elements need to be monitored as some commercial kits fail to detect MRSA when there are polymorphisms in this area[44].

Other methods giving more rapid results may be considered, such as the latex agglutination-based method that detects the PBP2a protein which is commercially

available[45]. Although consideration to local prevalence rates of MRSA needs to be considered when using them[46].

Recommended Methods

Routine screening by direct plating:

A chromogenic selective MRSA agar.

Screening by molecular methods:

Use of a commercial method applied directly to screening swabs may be considered if very rapid results are required.

Screening by enrichment:

In particular circumstances (eg checking patients for clearance of MRSA) screening by an enrichment method may be used. Several swabs from the same patient can be combined in the same 2.5% NaCl nutrient broth. This is a cost-effective method where the aim is to determine the presence, rather than the site, of MRSA carriage.

Both direct plating and enrichment methods may be used. Enrichment delays reporting of results by 24hr but negative results with a more sensitive technique (enrichment) may be required before MRSA control measures are discontinued for that patient[47]. The advantage of enrichment over direct plating has yet to be confirmed with chromogenic media.

Antibiotic susceptibility testing

Detection of a presumptive MRSA strain should be followed by its full identification as *S. aureus,* confirmation of meticillin resistance and testing susceptibility to other antimicrobial agents. Conventional oxacillin susceptibility tests are markedly affected by test conditions and the use of cefoxitin in disc diffusion tests has been shown to be less affected by test conditions and to be more reliable than tests with oxacillin[48,49]. Both disc diffusion and breakpoint methods are widely used.

Technical Information/Limitations

Staphylococcus sciuri can give positive results with DNA and Staph aureus latex tests and can have the *mecA* gene and therefore grow on chromogenic MRSA medium with a blue green pigment. On blood agar it is a large yellow colony resembling *S. aureus*. It is easily distinguished from other Staphylococcci as it is Oxidase positive.

Other non-*S. aureus* species such as *S. intermedius* could also be misidentified as MRSA/MSSA.

Chromogenic media are affected by light and plates should be stored in the dark and not left in the light before or after inoculation. Incubation times for chromogenic media should be as recommended by the manufacturers.

The nature of selective media requires a balance between sensitivity and specificity bearing in mind cost implications. Selective media may not support the growth of all circulating strains. Refer to manufacturer’s instructions and recent evidence for limitations of growth.

Limitations of UK SMIs

The recommendations made in UK SMIs are based on evidence (eg sensitivity and specificity) where available, expert opinion and pragmatism, with consideration also being given to available resources. Laboratories should take account of local requirements and undertake additional investigations where appropriate. Prior to use, laboratories should ensure that all commercial and in-house tests have been validated and are fit for purpose.

Selective Media in Screening Procedures

Selective media which does not support the growth of all circulating strains of organisms may be recommended based on the evidence available. A balance therefore must be sought between available evidence, and available resources required if more than one media plate is used.

Specimen Containers[1,2]

SMIs use the term “CE marked leak proof container” to describe containers bearing the CE marking used for the collection and transport of clinical specimens. The requirements for specimen containers are given in the EU in vitro Diagnostic Medical Devices Directive (98/79/EC Annex 1 B 2.1) which states: “The design must allow easy handling and, where necessary, reduce as far as possible contamination of, and leakage from, the device during use and, in the case of specimen receptacles, the risk of contamination of the specimen. The manufacturing processes must be appropriate for these purposes”.

1 Safety Considerations[1,2,50-64]

1.1 Specimen Collection, Transport and Storage[1,2,50-53]

Use aseptic technique.

Collect specimens in appropriate CE marked leak proof containers and transport in sealed plastic bags.

Collect swabs into appropriate transport medium and transport in sealed plastic bags.

Compliance with postal, transport and storage regulations is essential.

1.2 Specimen Processing[1,2,50-64]

Containment Level 2.

Laboratory procedures that give rise to infectious aerosols must be conducted in a microbiological safety cabinet[56].

Refer to current guidance on the safe handling of all organisms documented in this SMI.

The above guidance should be supplemented with local COSHH and risk assessments.

2 Specimen Collection

2.1 Type of Specimens

MRSA screening specimens

2.2 Optimal Time and Method of Collection[65]

For safety considerations refer to Section 1.1.

Unless otherwise stated, swabs for bacterial and fungal culture should be placed in appropriate transport medium[66-70].

Screening swabs, catheter urine, etc as appropriate.

Swabs for bacterial and fungal culture should be placed in appropriate transport medium[67,71,72].

Collect specimens other than swabs into appropriate CE marked leak proof containers and place in sealed plastic bags.

Specimens for molecular methods should follow the recommendations for the method.

2.3 Adequate Quantity and Appropriate Number of Specimens[65]

N/A

3 Specimen Transport and Storage[1,2]

3.1 Optimal Transport and Storage Conditions

For safety considerations refer to Section 1.1.

Collect specimens before antimicrobial therapy where possible[65].

Specimens should be transported and processed as soon as possible[65].

If processing is delayed, refrigeration is preferable to storage at ambient temperature[65].

Swabs may be placed directly in enrichment broth on the ward. Swabs in enrichment broths should not be refrigerated. If ward staff are involved they should be adequately trained.

4 Specimen Processing/Procedure[1,2]

4.1 Test Selection

N/A

4.2 Appearance

N/A

4.3 Sample Preparation

For safety considerations refer to Section 1.2.

4.4 Microscopy

N/A

4.5 Culture and Investigation

Direct culture

Inoculate each agar plate with swab or other sample (Q 5 – Inoculation of Culture Media for Bacteriology).

Enrichment culture

Remove the cap aseptically from the container and place the swab(s) in the broth, break off (or cut) the swab-stick(s) and replace the cap.

4.5.1 Culture media, conditions and organisms

Clinical details/ conditions	Specimen	Standard media	Incubation			Cultures read	Target organism(s)
			Temp °C	Atmos	Time		
Direct culture	MRSA screening specimens	Chromogenic selective MRSA medium	37	Aerobic	18-48hr**	daily	MRSA
AND/OR							
Enrichment culture		Nutrient broth containing 2.5% NaCl *** then subculture to (*see below*)	30	Aerobic	18-24hr	N/A	
		Chromogenic selective MRSA medium	37	Aerobic	18-48hr**	daily	MRSA

* Consider a molecular method if rapid results are required.

**For chromogenic media refer to manufacturer's instructions for recommended incubation times.

***The bottle should contain a volume of broth sufficient to cover the swabs. The NaCl concentration should be reduced if locally prevalent strains are known to be inhibited by 2.5% NaCl.

4.6 Identification

4.6.1 Minimum level of identification in the laboratory

S. aureus species level, meticillin resistant.

Organisms may be further identified if this is clinically or epidemiologically indicated.

4.7 Antimicrobial Susceptibility Testing

Refer to British Society for Antimicrobial Chemotherapy (BSAC) and/or EUCAST guidelines.

4.8 Referral for Outbreak Investigations

N/A

4.9 Referral to Reference Laboratories

For information on the tests offered, turn around times, transport procedure and the other requirements of the reference laboratory click here for user manuals and request forms.

Organisms with unusual or unexpected resistance, and whenever there is a laboratory or clinical problem, or anomaly that requires elucidation should be sent to the appropriate reference laboratory.

Contact appropriate devolved national reference laboratory for information on the tests available, turn around times, transport procedure and any other requirements for sample submission:

England and Wales
http://www.hpa.org.uk/webw/HPAweb&Page&HPAwebAutoListName/Page/1158313434370?p=1158313434370

Scotland

http://www.hps.scot.nhs.uk/reflab/index.aspx

Northern Ireland

http://www.publichealth.hscni.net/directorate-public-health/health-protection

5 Reporting Procedure

5.1 Microscopy

N/A

5.2 Culture

Negatives

"MRSA not isolated"

Positives

"MRSA isolated"

5.2.1 Culture reporting time

Clinically urgent culture results to be telephoned or sent electronically when available.

Written report, 72hr stating, if appropriate, that a further report will be issued.

5.3 Antimicrobial Susceptibility Testing

Report susceptibilities as clinically indicated. Prudent use of antimicrobials according to local and national protocols is recommended.

MRSA should not be reported as susceptible to any currently available β-lactams although there are new β-lactam agents that are being introduced that have some activity against MRSA[73].

5.4 Toxin Detection

N/A

6 Notification to PHE[74,75] or Equivalent in the Devolved Administrations[76-79]

The Health Protection (Notification) regulations 2010 require diagnostic laboratories to notify Public Health England (PHE) when they identify the causative agents that are listed in Schedule 2 of the Regulations. Notifications must be provided in writing, on paper or electronically, within seven days. Urgent cases should be notified orally and as soon as possible, recommended within 24 hours. These should be followed up by written notification within seven days.

For the purposes of the Notification Regulations, the recipient of laboratory notifications is the local PHE Health Protection Team. If a case has already been

notified by a registered medical practitioner, the diagnostic laboratory is still required to notify the case if they identify any evidence of an infection caused by a notifiable causative agent.

Notification under the Health Protection (Notification) Regulations 2010 does not replace voluntary reporting to PHE. The vast majority of NHS laboratories voluntarily report a wide range of laboratory diagnoses of causative agents to PHE and many PHE Health protection Teams have agreements with local laboratories for urgent reporting of some infections. This should continue.

Note: The Health Protection Legislation Guidance (2010) includes reporting of Human Immunodeficiency Virus (HIV) & Sexually Transmitted Infections (STIs), Healthcare Associated Infections (HCAIs) and Creutzfeldt–Jakob disease (CJD) under 'Notification Duties of Registered Medical Practitioners': it is not noted under 'Notification Duties of Diagnostic Laboratories'.

http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/HealthProtectionRegulations/

Other arrangements exist in Scotland[76,77], Wales[78] and Northern Ireland[79].

Refer to the following:

Health Protection Agency publications:

"Laboratory reporting to the HPA. A guide for diagnostic laboratories".

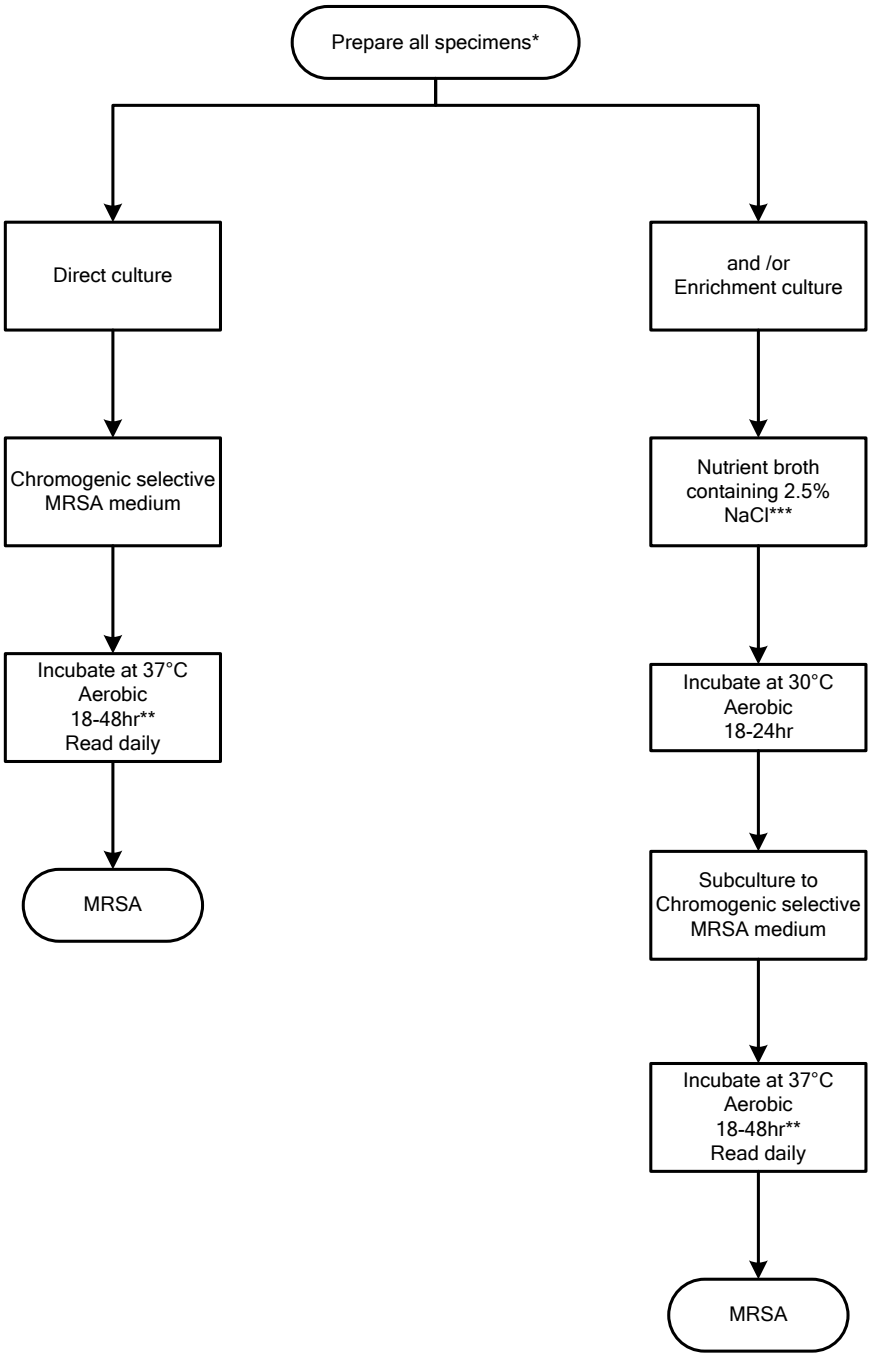
"Hospital infection control : Guidance on the control of infection in hospitals".

Local guidelines including Infection Control Policy and Memorandum of Understanding.

Appendix 1: Characteristics of UK MRSA

http://www.hpa.org.uk/web/HPAweb&HPAwebStandard/HPAweb_C/1284475013224

Appendix 2: Investigation of Specimens for Screening for MRSA



* Consider a molecular method if rapid results are required
** For chromogenic media refer to manufacturer's instructions for recommended incubation times
*** The bottle should contain a volume of broth sufficient to cover the swabs.

References

1. European Parliament. UK Standards for Microbiology Investigations (SMIs) use the term "CE marked leak proof container" to describe containers bearing the CE marking used for the collection and transport of clinical specimens. The requirements for specimen containers are given in the EU in vitro Diagnostic Medical Devices Directive (98/79/EC Annex 1 B 2.1) which states: "The design must allow easy handling and, where necessary, reduce as far as possible contamination of, and leakage from, the device during use and, in the case of specimen receptacles, the risk of contamination of the specimen. The manufacturing processes must be appropriate for these purposes".

2. Official Journal of the European Communities. Directive 98/79/EC of the European Parliament and of the Council of 27 October 1998 on *in vitro* diagnostic medical devices. 7-12-1998. p. 1-37.

3. Coia JE, Duckworth GJ, Edwards Di, Farrington M, Fry C, Humphreys H, et al. Guidelines for the control and prevention of meticillin-resistant Staphylococcus aureus (MRSA) in healthcare facilities. J Hosp Infect 2006;63 Suppl 1:S1-44.

4. Scottish Infections Standards and Strategies (SISS) Group. Guidance for the management of meticillin-resistant *Staphylococcus aureus*. The Royal College of Physicians of Edinburgh and the Royal College of Physicians and Surgeons of Glasgow. 2006.

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