Protocol for CRA MRSA Screening National Rollout in Scotland

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Document Amendment Log

Version no.	Date	Page no.	Amendment Summary
1.9	November 2018	5	Note added re MRSA CRA KPI monitoring system
1.9	November 2018	6	Additional note re requirement for screening on transfers between hospitals in the same health board
1.9	November 2018	10	Clarification re requirement to obtain answers to CRA questions from sources other than asking the patient
1.9	November 2018	11	Clarification re the requirement to document reason if patient has not been placed as per protocol
1.9	November 2018	17	Clarification re the answers to CRA questions are not based on asking the patient
1.9	November 2018	18	Clarification on post-decolonisation screening
1.10	December 2019	6	Clarification re screening in Accident and Emergency
1.10	December 2019	18	Additonal information added re decolonisation protocols
1.10	December 2019	11 and Appendix 1	Aide memoire updated to the Admission Screening CRA flowchart

1.1 Introduction

Admission screening by clinical risk assessment (CRA) allows for the early identification of patients who are colonised or are at high risk of being colonised, and allows them to be pre-emptively managed with the appropriate infection prevention and control precautions while swab results are awaited. There are two mandatory national screening policies in Scotland for MRSA and CPE (carbapenemase-producing Enterobacteriaceae).[1]

This protocol was developed using intelligence from extensive research studies into the effectiveness of nasal swabbing as a screening test, and the use of screening questions (a Clinical Risk Assessment, CRA) as a first line screening test in relation to effectiveness as well as resource implications.[2-4] The savings in resources compared with universal nasal swab-based screening also allow an enhanced programme for those patients for whom MRSA infection carries a particularly severe clinical impact – intensive care, orthopaedics, renal medicine and cardiothoracic/vascular surgery (please note this encompasses cardiothoracic, vascular and cardiovascular).

This protocol supersedes all previous versions of the national MRSA screening protocol, and represents a **minimum** level of screening which the Scottish Government Health and Social Care Directorate (SGHSCD) expects NHS Boards to undertake.

1.2 Background

In April 2009, the SGHSCD announced the implementation of a National MRSA Screening Programme in Scotland. The initial policy was based on the interim report of the MRSA Screening Pathfinder Programme published in April 2009.[5] The policy stated that all elective admissions plus emergency admissions to care of the elderly, nephrology/renal, dermatology and vascular surgery specialties should be screened for MRSA using nasal swab based screening. Special studies carried out in 2010 provided further information on the true effectiveness of nasal swabbing as a screening tool, and established that application of a simple Clinical Risk Assessment (CRA) tool comprising three questions allowed targeting of a small proportion of patients (around 10%) for swab screening using two anatomical sites (nose and perineum) with similar effectiveness but at a fraction of the cost. CRA screening was found to be as effective

as universal screening when compliance with application of the CRA was 90% or higher. The CRA approach also offers the opportunity to apply a consistent risk-based approach to pre-emptive management of patients at high risk of colonisation and infection. In addition, SGHSCD has accepted the recommendation from the MRSA Screening National Steering Group and the HAI Task Force that patients in defined high-impact specialties should all be offered swab-based screening (two anatomical sites) in addition to CRA screening.

In April 2013, the Chief Nursing Officer (CNO) wrote to boards confirming uptake of CRA as an HAI Level 3 Indicator[6], requiring boards to monitor locally, and for HPS to report the Scottish figure annually. The measurement of the uptake of MRSA CRA as a key performance indicator (KPI) is collected using the National MDRO HAI Admission Screening Uptake Monitoring Tool.

Throughout this document, 'MRSA screening' refers to the two stage process of universal application of the CRA screening, followed by swab-based screening of those judged to be at risk based on response to the CRA questions or cared for within one of the high impact specialties. Swab screening refers to swabbing in two anatomical sites, nose and perineum and if present, wound sites or devices.

1.3 Aims of Screening

The aim of screening patients for MRSA is to identify patients that are colonised or infected with the organism (colonisation carries a fifteen-fold increase in the risk of invasive MRSA infection[4]). These patients can then be managed appropriately to reduce the risk of self-infection and of transmitting the organism to other patients.

The CRA is a first-line screen, which identifies a small subset of patients who then proceed to second-line swab-based (microbiological culture) screening.

These measures aim to reduce the negative impact that MRSA has on patients and the additional burden on healthcare resources.

1.4 Purpose of this Document

The purpose of this document is to provide NHS Boards with the information and protocols required to carry out the revised approach to MRSA screening as required by the SGHSCD.

1.5 Who should be screened, when should they be screened and how should they be screened?

MRSA screening applies to patients for the duration of their care within an acute hospital, that is to say upon admission and then any transfers that take place during their care, including transfers to another hospital in the same health board. This means that a patient may require to go through the MRSA screening process more than once when receiving their care. The MRSA screening policy does not prevent additional screening being undertaken locally as per local infection control policies.

Table 1 sets out the requirements for patients upon their original admission and Table 2 sets out the requirements should patients be transferred during their care. Therefore screening outlined in Table 2 is in addition to screening to be undertaken in Table 1.

Table 1: Inpatient Admissions

Type of admission	**When should they be screened?**	**How should they be screened?**
Elective patients to high impact specialties	At pre-assessment or outpatient clinic where possible, if not then on admission to hospital (within 24 hours of admission, and certainly prior to the elective procedure, whichever comes sooner)	CRA and then two body site swabbing (nasal and perineal)
Elective patients to non-high impact specialties		CRA and if they answer yes to at least one question, two body site swabbing (nasal and perineal)
Emergency patients to high impact specialties	On admission to hospital, within 24 hours of admission. It is not recommended that screening is undertaken in Accident and Emergency.*	CRA and then two body site swabbing (nasal and perineal)
Emergency patients to non-high impact specialties		CRA and if they answer yes to at least one question, two body site swabbing (nasal and perineal)

* local decision to screen in A&E may be taken to assist with patient placement prior to admission

Table 2. Patients transferred during their care

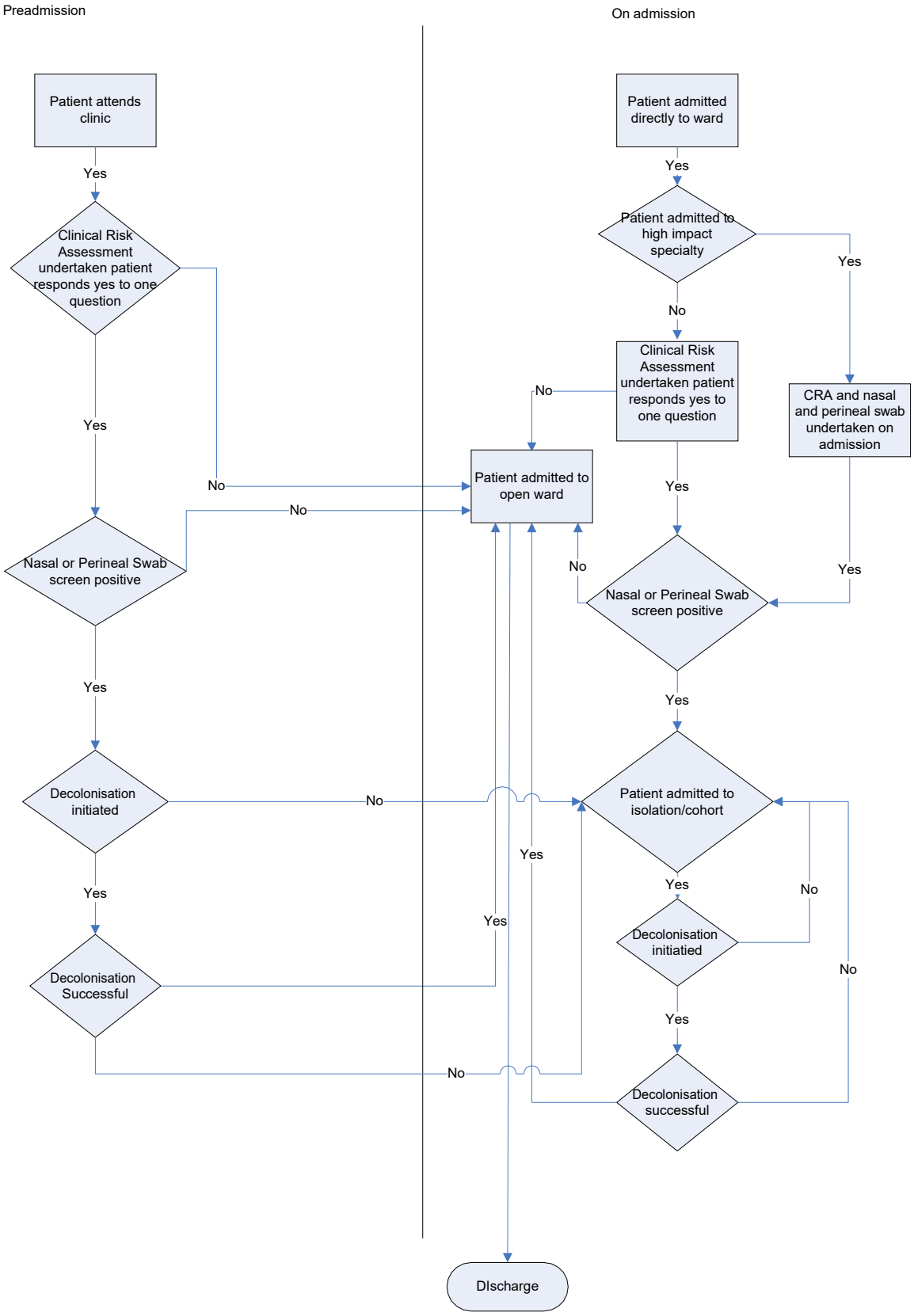
Type of transfer	**When should they be screened?**	**How should they be screened?**
Transfer into a high impact specialty (from any source other than another high impact specialty)	Once they have been transferred into their new location (within 24 hours).	CRA and then two body site swabbing (nasal and perineal). Note: If the patient has previously been swabbed and the result is awaited from the lab, there is no requirement to again swab the patient.
Transfer from one hospital into another hospital regardless of the specialty		
Transfer from one high impact specialty to another high impact specialty in the same hospital	There is no requirement to undertake another screen.	N/A
Transfer from one non-high impact specialty to another non-high impact specialty in the same hospital		

High impact specialities refers to: Intensive Care, Orthopaedics, Renal Medicine, Vascular Surgery and Cardiothoracic Surgery

As per current UK guidelines, routine screening of staff members is not recommended.[7]

The complete patient pathway for all patients is presented in Figure 0-1.

Figure 2-1: Complete patient pathway for all admissions



1.5.1 Exclusions

Patients admitted to the following specialties are considered to be at low risk of MRSA colonisation/infection and do not require to be screened under the terms of the national programme. Local circumstances or acute incidents may however mean that there is a local decision to screen some or all of the patients in these specialties:

- Mental Health/Psychiatry
- Maternity / Obstetrics
- Paediatrics

Please note these exclusions only apply to patients admitted to the above specialties. Mental health/psychiatry, maternity/obstetrics or paediatric patients should not be excluded if they are being cared for in another included specialty.

Due to their short length of stay, all day cases (i.e. patients not admitted overnight) are also excluded.

1.5.2 Patients out on pass

Patients on ‘overnight pass’ or weekend release should not be rescreened when readmitted if the entire period of hospital attendance is regarded as a single episode of patient care.

1.5.3 Patients in long term care

Rescreening of patients with prolonged admissions should be an issue for local policy, depending on MRSA prevalence in that clinical setting and the potential clinical impact of MRSA infection.

1.6 Administration of the CRA

Administration and recording of the CRA is part of the nursing admission/booking process; patients with a positive answer to at least one of the CRA questions will proceed to nasal and perineal swab screening, plus wound/device swabs (if appropriate).

For every patient, the answer to three questions should be sought:

1. Has the patient any previous **history of MRSA** colonisation or MRSA infection **at any time in the past**?
2. Is the patient currently **resident in a care home or institutional setting** (e.g. prison, homeless hostel), or **transferred from another hospital** (either within or outwith own NHS Board)?
3. Does the patient have a **wound/ulcer** or **invasive device** which was present before admission to this hospital? Please note a wound is a skin break and an invasive device is a device which temporarily enters the skin, resulting in a skin break.

Around 10% of patients overall are likely to be identified as being at higher risk of MRSA colonisation through CRA screening, although this will vary by specialty.

The following sources of information are likely to be more robust than patient recall and should be reviewed:

1. Data from laboratory systems for previous history of MRSA colonisation/infection
2. Flags/alerts that have been added to Patient Administration System indicating previous MRSA positive status
3. Source of admission other than from own home from Patient Administration System or other documentation
4. Physical inspection for wounds and invasive devices

On occasions, no information may be available on one or more of the CRA questions, and there may be no strong indications either way from other observations or information to infer a likely answer. A ‘not known’ answer is statistically much more

likely to be negative than positive in such situations, and should normally be handled as a negative response.

A positive answer to one or more of the CRA questions indicates two actions:

1. Proceed to nasal and perineal swab screening
2. Take pre-emptive action to minimise risk of further transmission of MRSA eg isolation in a single room, or cohort nursing with other higher risk patients pending swab results

The answers to the three questions should be recorded within the nursing admission notes, as should the resulting patient status and actions required.

An Admission Screening CRA flowchart is provided in Appendix 1. This document provides frontline staff with guidance to completing the CRA and the actions required based on the answers to the CRA questions (for both MRSA and CPE CRA).

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

- Low risk of MRSA colonisation – no further action currently required
- Manage patient placement as if MRSA positive

The actions required for the latter status include recording of:

- MRSA screening swabs (nasal and perineal) taken
- MRSA screening swabs – other combination taken [define]
- Patient isolated in single room
- Patient cohorted with other high risk patients, dedicated nursing
- Patient physically separated with other high risk patients, no dedicated nursing staff
- Patient managed in open ward with reasons for not placing as per protocol documented

1.7 Swab screening

Sample collection is the responsibility of the staff member running pre-assessment clinics or admitting patients within the health boards. A training resource has been developed by NES and is available via the following link: http://www.nes.scot.nhs.uk/education-and-training/by-theme-initiative/healthcare-associated-infections/online-short-courses.aspx

The minimum swab screening will be nasal and perineal swabs. These samples will be taken (a) from the anterior nares (nose), both nostrils on one swab, and (b) from the perineum. If there are clinical reasons for not taking a perineal swab, or if the patient refuses, a throat swab can be substituted, however the diagnostic effectiveness of nasal and throat swab screening is significantly lower than nasal and perineal swab screening.[3]

A summary of the rationale for this choice of body sites can be found in Appendix 2.

Please note, if areas within a Board already undertake swabbing in more than two body sites (including nasal and perineal), it is acceptable to continue this practice as it is above the national minimum policy. However, these areas will still be required to introduce CRA as it allows for appropriate patient placement.

Any wounds, skin breaks or sites of invasive devices should also be sampled on separate swabs. Additional sites may also be considered for swab screening due to the nature of the procedure being undertaken, such as throat, groin and axilla. However the diagnostic return from axilla swab screening is likely to be very small and may only be of interest for procedures directly involving the axilla. Patients with indwelling urinary catheters should have a urine sample sent for MRSA testing, but there is no requirement to also swab the urinary catheter site.

1.7.1 Patient consent and collecting the swabs

Please note that privacy and comfort should be assured before commencing screening.

Patients eligible for swab screening (either by positive response to CRA questions or due to admission to a high impact specialty) should be provided with a patient information leaflet (See Appendix 3) and given the opportunity to read the leaflet and discuss fully with clinical staff. A patient information poster is also available (See Appendix 4). Clinical staff should emphasise that MRSA screening detects colonisation – not infection – and that patients may receive decolonisation as a result of a positive screen.

Verbal consent to have swab taken should be sought from the patient prior to screening. Patients are free to decline consent. If a patient is unable to give consent, hospitals should follow local policy in dealing with adults with incapacity.

The following procedure should be employed to obtain a swab for MRSA culture.

The following equipment is required;

1. Sterile swabs for culture in Ames medium or charcoal medium (single sterile tipped applicator swab/plastic outer transport case with transport medium). Check expiry date.
2. Laboratory request form (specimen for culture)
3. Plastic specimen bag

Before collection hand hygiene should be performed and then disposable gloves and disposable apron should be donned.

Please note that of all body sites being swabbed the perineum should always be the last in the swabbing sequence.

Collection Procedure – nasal swab

1. If patient has nasal discharge ask them to clear the discharge by blowing his/her nose into a non scented tissue.
2. Do not attempt to clear the discharge with swabs as this may be excessively traumatic.
3. Open and remove sterile tipped swab applicator from transport casing.
4. Taking care to avoid other contact with swab, insert the swab approximately 1-2 cm (approx ¾ inches) into the first nostril next to the nasal septum.

5. Rotate the swab against the anterior nasal mucosa for 3 – 5 seconds.
6. Using the same swab, repeat for the other nostril.
7. Carefully place used swab back into transport tube and secure.

Collection Procedure – perineal swab

1. Ask the patient to loosen their clothing
2. Open and remove sterile tipped swab applicator from transport casing.
3. Taking care to avoid other contact with swab, rotate the swab against the perineal skin (the area between the anus and external genitalia) for 3 – 5 seconds.
4. Carefully place used swab back into transport tube and secure.

If a throat swab is being taken in the absence of a perineal swab, the procedure is as given below:

Collection Procedure – throat swab

1. Open and remove sterile tipped swab applicator from transport casing.
2. Taking care to avoid other contact with swab, rotate the swab against the tonsillar area and pillars of the fauces for 3 – 5 seconds.
3. Carefully place used swab back into transport tube and secure.

For All swabs:

1. Fill in appropriate patient details as requested or affix patient label on outer aspect of transport tubes. Ensure recording of date and time swab was collected as well as the location (either ward, pre-admission clinic etc).
2. Complete the specimen request form as per local laboratory protocol. This would normally include the following information:
   Name
   Age
   Date of Birth
   CHI number if available.
   Location: ward / preassessment clinic etc
   Anatomical site of swab (nasal, perineum, wound etc)
   Test request: culture and sensitivity

Purpose / rationale: MRSA screening [it is important to define this clearly as a screening swab, either on the generic form or through use of a dedicated MRSA screening form]

Date and time sample collected

Antibiotics currently prescribed

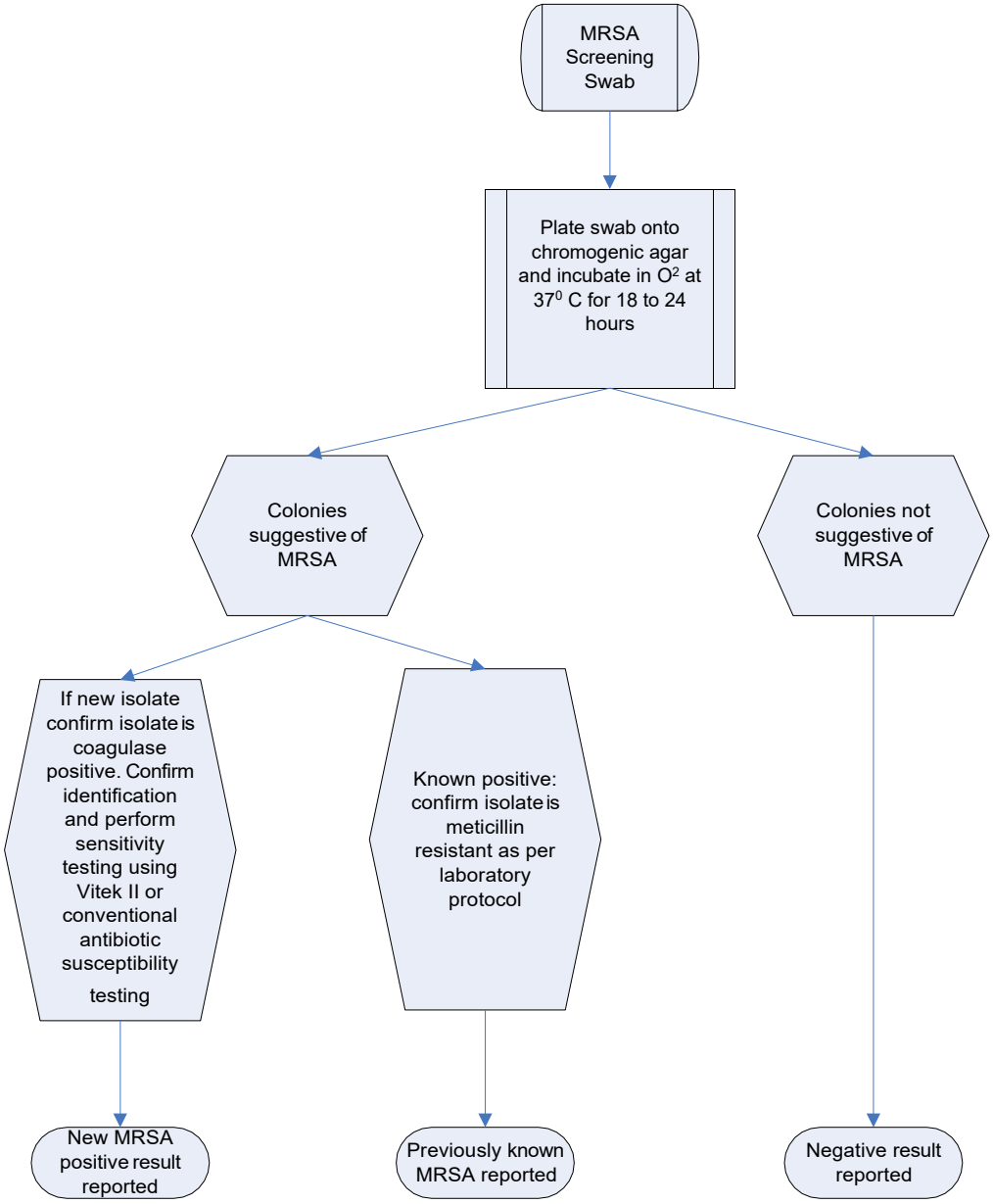
Reason for admission

3. Place swab specimens and laboratory request form in specimen bag and secure.
4. Leave for collection in designated area per normal procedure for uplift and transfer to the laboratory. If pickup is delayed and swab is likely to be left overnight, place in dedicated specimen fridge until the next collection is due.

1.8 What laboratory test will be undertaken on the screening samples?

The samples should be tested using chromogenic agar. If the colour change is suggestive of MRSA colonies, a confirmatory coagulase test and sensitivity testing should be carried out. Mupirocin resistant strains should be referred to the Consultant Microbiologist. The laboratory testing protocol is shown in Figure 0-2.

Figure 2-2: Laboratory testing of MRSA samples



1.9 What should the laboratory do when the results of an MRSA screen is known?

Negative and positive results are dealt with as per local protocol.

1.10 When is a patient considered MRSA positive?

The MRSA confirmed positive patient has laboratory confirmed MRSA colonisation or infection during, or within 18 weeks prior to, the hospital admission in question, without subsequent evidence of decolonisation or cure.

For the purposes of this programme, however, a patient on admission is managed “as if MRSA positive” (and therefore should be isolated where possible) if they fulfil one or more of the following criteria;

- Patients with positive answers to any of the three CRA questions based on direct observation, laboratory data, case note record or admissions records
- Patients identified as colonised at a pre-admission or outpatient clinic and not successfully decolonised before admission

1.11 What should happen to patients who are confirmed by laboratory test as MRSA positive?

Patients that have been identified as MRSA positive by laboratory confirmed testing of a screening swab or clinical specimen should be isolated and considered for decolonisation treatment.

These patients should also be provided with information providing details on MRSA colonisation and their treatment. They should be provided with an opportunity to discuss the implications of their diagnosis with a trained member of staff and their clinical team.

Sections 1.12 and 1.13 detail the protocols for isolation and decolonisation of MRSA positive patients.

1.12 Decolonisation

The aim of decolonisation is to reduce the burden of MRSA carried by the patient at a time when they are undergoing invasive procedures and are at most risk. A second aim is to reduce the likelihood of cross-transmission of MRSA from patient to patient. All patients identified as MRSA positive by swab screening should be considered for decolonisation. Decolonisation is undertaken according to current guidelines[7]

Decolonisation in Hospital

1) Patient is identified as MRSA positive by swab screen taken on admission to hospital or specialty.
2) Agreement to commence decolonisation treatment should be obtained from the patient and clinician
3) MRSA positive patients should receive nasal mupirocin (2% in a paraffin base), three times daily for five days and should bathe daily for 5 days using 4% chlorhexidine body wash*.
4) If the patient remains in hospital, MRSA screening to confirm decolonisation should take place at least 48 hours after the completion of the decolonisation treatment. This requires 3 sets of consecutive nasal swabs, taken at least 48 hours apart.
5) If the results of any of the of post-decolonisation screens are positive, a second course of mupirocin (three times daily, and appropriate body wash, daily, for five days) should be given.
6) If the patient remains in hospital following the second course of decolonisation treatment, post-decolonisation screening samples should be taken. This requires 3 sets of consecutive nasal swabs, taken at least 48 hours apart.
7) If the results of any of post-decolonisation screens after a second course of decolonisation treatment are positive, the patient should be referred to the Consultant Microbiologist.

*If chlorhexidine is not appropriate, povidone iodine (7.5%) or triclosan (2%), are acceptable alternatives

Decolonisation prior to admission

1) Patient identified as MRSA positive by swab screen taken at pre-admission clinic
2) Decolonisation treatment should be sent to the patient. Home decolonisation treatment using mupirocin and appropriate body wash should be used as per protocol for inpatient decolonisation.

Patients with positive pre-admission swab screen are called back to the pre-admission clinic after completion of the decolonisation treatment to be rescreened if appropriate.

The patient should receive decolonisation treatment by one of the following options;

- Via out-patient department
- Via district nurse
- Recorded delivery of treatment directly to patient's home
- Prescription sent to the patient's home
- GP (subject to local agreement).

Adverse reactions to decolonisation treatment should be reported using existing protocols.

1.13 Isolation

MRSA positive patients should be isolated wherever possible. If isolation is not possible (e.g. due to lack of rooms), MRSA positive patients should be cohorted or physically separated alongside other MRSA positive patients. Isolation, cohorting and separation are defined below and should be undertaken according to the HPS National Infection and Prevention Control Manual.[8]

Isolation: Patient is placed in a single room with hand washing facilities, ideally with ensuite toilet and shower where available. Isolation should be undertaken according to the HPS National Infection and Prevention Control Manual.[8]

Cohorting: Patient is placed in a room and cared for by dedicated nursing staff along with other patients who are MRSA screen positive. Cohorting should be undertaken according to the HPS National Infection and Prevention Control Manual.[8]

Separated: Patients who are MRSA screen positive are housed within the same room as patients who are not MRSA positive but are separated by at least three feet from any adjacent persons by use of: cubicles or use of closed bed curtains. This is considered to be a step down from full cohorting. These patients do not have separate nursing staff. Separation should be undertaken according to the HPS National Infection and Prevention Control Manual.[8]

Standard Infection Control Precautions should be adhered to rigorously at all times as a proportion of patients on the open ward at any time may be MRSA positive

MRSA positive patients should remain in isolation until they have been successfully decolonised.

2 Glossary

Admission: Occurs when a patient occupies an available staffed bed in a hospital and remains overnight whatever the original intention. See inpatient definition for more details.

Admission screen: Clinical Risk Assessment (CRA) screening, followed by nasal and perineal swab screening for those with positive CRA responses or being cared for in a high impact specialty**;** this will be undertaken by hospital staff on or as soon after admission as is possible according to local protocols.

Admission types – emergency or unplanned: For clinical reasons, a patient is admitted at the earliest possible time, usually immediately, after seeing a doctor - the patient will not necessarily be admitted via an accident and emergency department.

Admission types – routine, planned or elective: All admissions where the patient is admitted as planned are termed “routine”. In most cases patients are admitted directly from their home for inpatient or day case treatment following a period on the waiting list.

Boarder: A patient that is being cared for by a physician who specialises in a specialty which is not normally cared for on the ward who is under the care of a specialty not usually attendant on the ward.

Care Home: A service which provides accommodation, together with nursing, personal care or personal support for vulnerable people

Clinical Risk Assessment: the answers to three questions are sought from the patient or from hospital data and direct observation; the questions comprise

1. Does the patient have any past history of MRSA infection or colonisation?
2. Was the patient admitted from anywhere other than home?
3. Does the patient have any pre-existing wounds, skin lesions or indwelling medical devices?

Cohorting: Patient is placed in a room and cared for by dedicated nursing staff along with other patients who have the same MRSA status

Colonisation: MRSA is present on the skin without any host response.

Consent: If a patient verbally agrees to have screening swabs taken in a pre-admission clinic or on admission implied consent is given.

Contact precautions: Techniques used in infection prevention and control to prevent person to person contact and spread of pathogens.

CRA: see **Clinical Risk Assessment**

Day case: A patient who makes a planned attendance to a specialty for clinical care sees a doctor or dentist or nurse (as the consultants' representative) and requires the use of a bed or trolley in lieu of a bed. The patient is not expected to, and does not, remain overnight. Many of these patients require anaesthesia. These patients are excluded from the programme.

Decolonisation: Treatment designed to reduce the burden of MRSA colonisation on a patient known to be MRSA positive. This will be undertaken according to local protocols for decolonisation.

Discharge: An inpatient discharge marks the end of an inpatient episode of care and occurs when the patient:

a. Is discharged to a location external to the NHS
b. Is transferred to another NHS inpatient or day case service in another hospital
c. Dies

Hence inpatient discharges include deaths and inpatient transfers-out.

Elective or planned admission: A patient who has been admitted at a pre-arranged time for a planned procedure.

Emergency or unplanned admission: A patient who has been admitted without a preadmission/pre-assessment appointment. These patients will include urgent GP referrals, accident and emergency patients, clinical referrals.

Hospital Associated MRSA infection: A laboratory confirmed MRSA clinical sample taken >48 hours after admission and patient shows signs or symptoms according to the CDC Nosocomial infection definition criteria.

Healthcare Associated MRSA infection: An MRSA infection which is generally associated with healthcare, but not necessarily attributed to a particular hospital admission.

Infection prevention and control measures: These include isolating, cohorting and decolonisation where appropriate, with the ultimate aim of minimising the risk of patients infecting themselves or infecting/colonising others as a result of their colonisation status

Inpatient: Patients who are admitted to an acute specialty and who stay overnight. These patients would be included in ISD overnight returns.

Isolation: Patient is placed in a single room with hand washing facilities, ideally with ensuite toilet and shower where available.

Meticillin Resistant *Staphylococcus aureus* (MRSA): Strain of the bacterium *Staphylococcus aureus* which is resistant to the antibiotic meticillin.

Meticillin sensitive *Staphylococcus aureus* (MSSA): Strain of the bacterium *Staphylococcus aureus* which is not resistant to the antibiotic meticillin.

Mupirocin: An antibiotic used in a nasal cream to decolonise patients colonised with microorganisms including MRSA from the nose.

Nares: Nostrils.

Post decolonisation test: MRSA screening for decolonisation should take place at least 2 days after the cessation of the decolonisation treatment. This requires 3 sets of nasal swabs taken with at least two days elapsing between each sample being taken

Pre-admission clinic: Clinic attended by patients prior to admission where they are screened for MRSA using CRA +/- swab screening. This will include pre-admission clinics and outpatient clinics.

Pre-admission screening: This will be undertaken before patients are admitted.

Screening: A public health service in which members of a defined population, who do not necessarily perceive they are at risk of a disease or its complications, are asked a question or offered a test (CRA in this case) to identify those individuals who are most likely to be helped by further more expensive or more invasive 'second line' tests (swab screening in this case) or treatment.

Sensitivity (identifying as many true positives as possible) is the cardinal attribute for a first line screening test, and specificity (reliably identifying true negatives) for a second line test.

Separated: Patients who have the same MRSA status are placed within the same room as patients who are not MRSA positive but are separated by at least three feet from any adjacent persons by use of: cubicles or use of closed bed curtains. This is considered to be a step down from full cohorting. These patients do not have separate nursing staff.

Standard infection control precautions: Standard Infection Control Precautions are designed to prevent cross transmission from recognised and unrecognised sources of infection. These sources of (potential) infection include blood and other body fluids secretions or excretions (excluding sweat), non-intact skin or mucous membranes and any equipment or items in the care environment which are likely to become contaminated[8]

Reference List

(1) Health Protection Scotland. Toolkit for the early detection, management and control of carbapenemase-producing Enterobacteriaceae in Scottish acute setting. 31-5-2016 http://www.hps.scot.nhs.uk/haiic/amr/publicationsdetail.aspx?id=55186 Accessed:1-6-2016

(2) Health Protection Scotland. SBAR Report to Scottish Government Health Directorates: policy implications of further research studies for national rollout of MRSA screening. Glasgow: Health Protection Scotland; 2010 Nov 30.

(3) Health Protection Scotland. The value of nasal swabbing versus full body screening or clinical risk assessment to detect MRSA colonisation at admission to hospital. Glasgow: Health Protection Scotland; 2010 Oct.

(4) Health Protection Scotland on behalf of Pathfinder Health Boards. Final Report Volume 1: An investigation of the clinical effectiveness of MRSA screening. Glasgow: Health Protection Scotland; 2009 Dec.

5) Health Protection Scotland. NHS Scotland MRSA screening pathfinder programme - Interim report. Glasgow: Health Protection Scotland; 2009.

(6) Scottish Government Health Department. MRSA Key Performance Indicators. CNO(2013)01. Scottish Government Health Department 2013 [cited 2015 Mar 23];Available from: URL: http://www.sehd.scot.nhs.uk/cmo/CNO(2013)01.pdf

(7) 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 May;63(Suppl 1):S1-44.

(8) Health Protection Scotland. National Infection Prevention and Control Manual. HPS 2015 [cited 2016 Apr 20];Available from: URL: http://www.nipcm.hps.scot.nhs.uk/

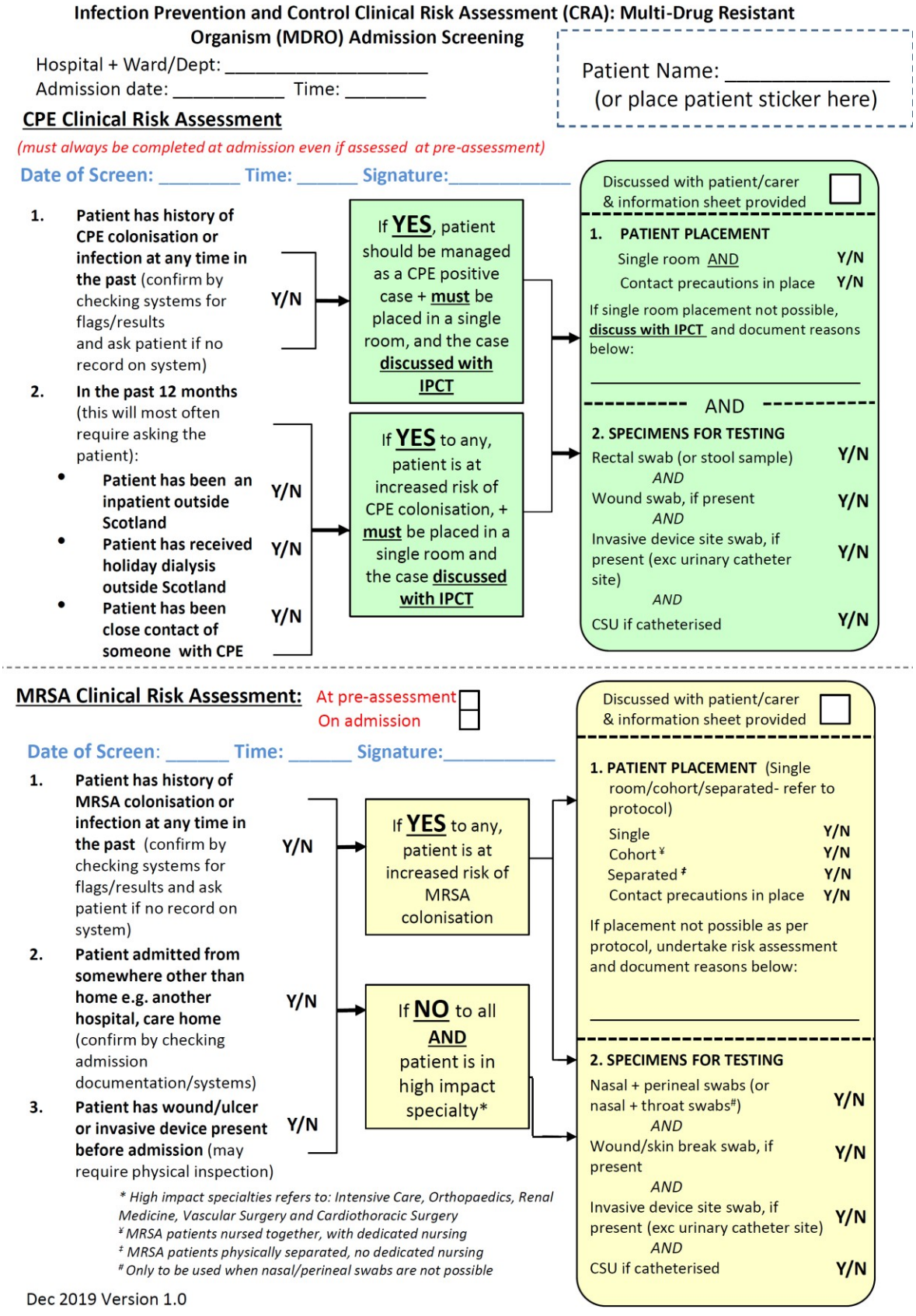
(9) Bitterman Y, Laor A, Itzhaki S, Weber G. Characterization of the best anatomical sites in screening for methicillin-resistant *Staphylococcus aureus* colonization. Eur J Clin Microbiol Infect Dis 2010 Apr;29(4):391-7.

(10) Lautenbach E, Nachamkin I, Hu B, Fishman NO, Tolomeo P, Prasad P, et al. Surveillance cultures for detection of methicillin-resistant *Staphylococcus aureus*: diagnostic yield of anatomic sites and comparison of provider- and patient-collected samples. Infect Control Hosp Epidemiol 2009 Apr;30(4):380-2.

11) Harbarth S, Schrenzel J, Renzi G, Akakpo C, Ricou B. Is throat screening necessary to detect methicillin-resistant Staphylococcus aureus colonization in patients upon admission to an intensive care unit? J Clin Microbiol 2007 Mar;45(3):1072-3.

(12) Meurman O, Routamaa M, Peltonen R. Screening for methicillin-resistant *Staphylococcus aureus*: which anatomical sites to culture? J Hosp Infect 2005 Dec;61(4):351-3.

Appendix 1. MDRO Admission Screening CRA Flowchart



Appendix 2. Rationale for body site screening

Evidence:

- Two screens are better than one [3;9-12] for detecting MRSA colonisation.
- Special studies undertook perineal, nose, throat and axilla screens
- There is minimal published evidence to compare perineal and groin screens in terms of identification of MRSA colonisation. There is really no evidence above which of groin or perineum is best.
- The policy is based on the special studies undertaken within the Pathfinder Boards which aimed to identify which combination of sites tested was the best.
- The Pathfinder Programme has evidence of ascertainment of MRSA colonisation for perineal screening against a gold standard.
- The working group argued the case for perineal screening from a biological perspective i.e. the perineum is closer to the rectum than the groin, therefore more colonisations may be found there.

Our position is:

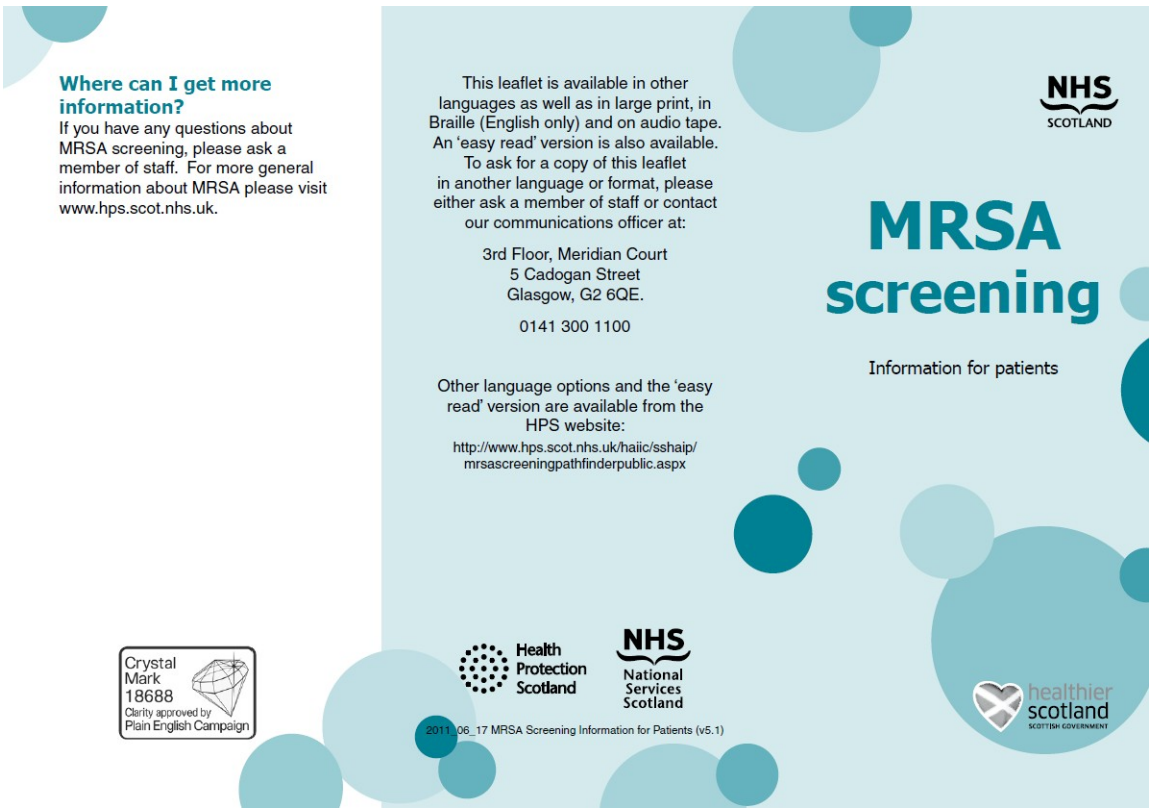
The evidence base within the MRSA Screening Programme study concludes that CRA, and then lab screening using nasal plus perineal body sites. The programme board suggest throat screening when perineal cannot be done. Groin screening was not evaluated during this study, as the expert working group deemed that perineum was the preferred body site for the research study purpose- which was to identify as many colonised patients as we possibly could.

It is important to consider that CRA is our first line screening and the laboratory tests are focused on the group of patients who have increased risk of colonisation, or are at risk of any MRSA infection having a high impact on their quality of life.

If new good quality evidence is published HPS would consider reviewing this.

Consideration for local teams:
The MRSA screening programme is a national programme which sets out a minimum SGHD policy for all inpatients in Scotland. Nasal plus perineal screens are the recommendation based on the work undertaken within the MRSA Screening Programme and the currently available literature.
Decision making on an individual case basis is with the local clinical teams
Consideration should be given to potential impact of MRSA infection for the patient; their ability to provide a perineal swab, and the procedures they will undergo during their current hospital stay.

Appendix 3. Patient information leaflet - screening



Where can I get more information?

If you have any questions about MRSA screening, please ask a member of staff. For more general information about MRSA please visit www.hps.scot.nhs.uk.

This leaflet is available in other languages as well as in large print, in Braille (English only) and on audio tape. An 'easy read' version is also available. To ask for a copy of this leaflet in another language or format, please either ask a member of staff or contact our communications officer at:

3rd Floor, Meridian Court
5 Cadogan Street
Glasgow, G2 6QE.

0141 300 1100

Other language options and the 'easy read' version are available from the HPS website:
http://www.hps.scot.nhs.uk/haiic/sshaip/mrsascreeningpathfinderpublic.aspx

NHS SCOTLAND

MRSA screening

Information for patients

Crystal Mark 18688
Clarity approved by Plain English Campaign

Health Protection Scotland

NHS National Services Scotland

2011_06_17 MRSA Screening Information for Patients (v5.1)

healthier scotland
SCOTTISH GOVERNMENT

In Scotland, hospitals that treat emergency patients and carry out operations are introducing MRSA (meticillin resistant staphylococcus aureus) screening. Screening is just one of the ways we are continuing to tackle infections such as MRSA in hospitals. This leaflet will give you some more information on MRSA screening and what it means to you. Your hospital can also give you more information about MRSA. Please ask your doctor or nurse if you have any questions.

What is MRSA?

MRSA is a common bacterium. It stands for meticillin resistant staphylococcus aureus. Staphylococcus aureus is a common type of bacterium that can live on your skin and not cause you harm, but can sometimes cause a number of common infections. Usually, having staphylococcus aureus in your nose or on your skin will not harm you, as the bacterium is not normally a risk to healthy people. People who carry it are not aware they do, and most of them will not have any symptoms. MRSA is a type of staphylococcus aureus that can no longer be treated by meticillin (a type of antibiotic), but we can treat it by using a body wash and a cream for your nose. It is estimated that around 5% of all patients who are admitted to hospital have the MRSA bacterium on their skin or in their nose already, even though they may feel well.

How is MRSA spread?

MRSA is mainly spread from person to person through hand contact. This is why washing your hands and using alcohol-based hand gels are so important. Good hand hygiene is one of the most important and effective ways of stopping the spread of MRSA.

What is screening and why is it being done?

MRSA screening involves identifying and testing patients who are admitted to this hospital so we can see who is already carrying the bacterium. The MRSA bacterium is more likely to cause an infection in people who are unwell, which is why it's so important to identify people in a hospital who have MRSA on their body before it can cause them harm or spread to others. If we can identify those patients who have MRSA on their body when they come into the hospital, we can make sure that they receive the best and most appropriate care.

Who do you test for MRSA?

If you stay overnight in hospital and are identified as at risk we will test you for MRSA.

How will you take my sample?

A member of hospital staff will collect a sample by taking a swab from your nose and your perineum (the area between the anus and the genitals) using a cotton bud. This is usually painless and only slightly uncomfortable. We will respect your privacy and dignity at all times when we are taking these samples.

What happens if you find MRSA in my sample?

We can treat MRSA. Treatment is not always appropriate for everyone. Your doctor will discuss the most appropriate care with you. Please speak to your doctor or nurse if you are worried about any part of your treatment. If you have MRSA, we will usually care for you separately from other patients.

Appendix 4. Information Poster