PROGRAM Standard Operating Procedure – Laboratory Services	
Title: MIC31000 – MRSA Screen	Policy Number:
Program Name: Laboratory Services	
Applicable Domain: Lab, DI and Pharmacy Services	
Additional Domain(s):	
Effective Date:	Next Review Date:
Issuing Authority: Director, Health Services	Date Approved:
Accreditation Canada Applicable Standard: N/A	

GUIDING PRINCIPLE:
Specimens are submitted to identify carriers of methicillin-resistant *Staphylococcus aureus* (MRSA). Swabs may be submitted from any body site, but most common are nasal, groin and wound swabs. Combined nasal/axilla/rectal/perineum swabs may also be processed. MRSA may occasionally be found exclusively in urine or sputum and specimens from such sites should be processed after consultation with Infection Prevention and Control.

PURPOSE/RATIONALE:

This standard operating procedure describes the screening for Methicillin Resistant *Staphylococcus aureus* (MRSA) on admission and as part of Multi-Resistant Organism (MRO) screens.

SCOPE/APPLICABILITY:
This procedure applies to Medical Laboratory Technologists (MLTs) processing specimens for MRSA screen.

SAMPLE INFORMATION:

Type	Swab • Amie's with or without charcoal
Source	• Bilateral nasal or groin swab • MRO screen: any site
Stability	If the sample is received in the laboratory and processed greater than 48 hours from collection: • Add specimen quality comment: "Delayed transport may adversely affect pathogen recovery"

Storage Requirements	Room temperature
Criteria for rejection	1. Unlabeled/mislabeled swabs 2. Specimen container label does not match patient identification on requisition 3. Duplicate specimens obtained with same collection method from same collection location within 24 hours

REAGENTS and/or MEDIA:

- MRSA*Select* II agar (MRS) and Blood agar (BA)
- Identification reagents: catalase, Staph latex test and tube coagulase

SUPPLIES:

- Disposable inoculation needles
- Wooden sticks

EQUIPMENT:

- Biosafety cabinet
- 35° ambient air incubator
- Vitek 2 and supplies

SPECIAL SAFETY PRECAUTIONS:

Containment Level 2 facilities, equipment, and operational practices for work involving infectious or potentially infectious materials or cultures:

- Ensure that appropriate hand hygiene practices be used
- Lab gown must be worn when performing activities with potential pathogens
- Gloves must be worn when direct skin contact with infected materials is unavoidable
- Eye protection must be used when there is a known or potential risk of exposure of splashes
- All procedures that may produce aerosols, or involve high concentrations or large volumes should be conducted in a biological safety cabinet (BSC)
- The use of needles, syringes and other sharp objects should be strictly limited

All patient specimens are assumed to be potentially infectious. Routine Practices must be followed. Since viable micro-organisms are used, all cultures must be handled with appropriate precautions. All equipment in contact with cultures should be decontaminated by appropriate methods.

QUALITY CONTROL:

- Refer to MIC60040-Culture Media Quality Control procedure
- Refer to Test Manual for reagent quality control procedures

PROCEDURE INSTRUCTIONS:

Step	Action
Processing swabs for MRSA screen	
1	Monday to Sunday, MRSA swabs are processed by 15:00.
2	In the biosafety cabinet: • Inoculate MRSA*Select* II agar with the swab • Ensure all surfaces of the swab make contact with the agar • Streak for isolated growth using a disposable inoculation needle
3	Label the MRS plate with: R (Date + 1 day).
4	Incubate the media: • Place MRS in the O_2 incubator in appropriate tray

INTERPRETATION OF RESULTS:

Step	Action	
1	• Observe MRS plate at 18 to 24 hours (9:00 to 15:00) • Examine for pink colonies	
2	If no pink colonies are seen at 18 to 24 hours: • Record observations in the LIS • Workup complete, MRSA not isolated	
3	If pink colonies are seen: • Record observations in the LIS • If isolated colonies are present, perform Staph latex test • If no isolated colonies are present, subculture pink colonies to BA	
4	**IF**	**THEN**
	Staph latex test NEGATIVE	• Record observations in the LIS • Workup complete, MRSA not isolated
	Staph latex test POSITIVE	• Record observations in the LIS • Select key 4 to add the media TC and Panel and to add the organism *Staphylococcus aureus* • Perform TC • Perform GPS

NOTE:

- If both nares and groin swabs have pink colonies, only 1 needs to be worked up
- If isolate that is worked up as per procedure is MRSA, non-worked up sample can be identified as *S.aureus* and MRSA comment &cx00 can be added

REPORTING INSTRUCTIONS:

IF	REPORT
No pink colonies	• Report: **"No Methicillin Resistant Staph aureus (MRSA) isolated"**
Pink colonies, Staph latex test NEGATIVE	• Report: **"No Methicillin Resistant Staph aureus (MRSA) isolated"**

Staph latex test POSITIVE Tube coagulase test NEGATIVE GPS Cefoxitin Screen POSITIVE or NEGATIVE	• Record observations in the LIS • Verify Panel results: ➢ Keep GPS results suppressed • Suppress *Staphylococcus aureus* isolate ID: ➢ Change isolate # to a letter • Report: **"No Methicillin Resistant Staph aureus (MRSA) isolated"**
Staph latex test POSITIVE Tube coagulase test POSITIVE GPS Cefoxitin Screen NEGATIVE	• Record observations in the LIS • Verify Panel results: ➢ Keep GPS results suppressed • Suppress *Staphylococcus aureus* isolate ID: ➢ Change isolate # to a letter • Report: **"No Methicillin Resistant Staph aureus (MRSA) isolated"**
Staph latex test POSITIVE Tube coagulase test POSITIVE GPS Cefoxitin Screen POSITIVE	• Record observations in the LIS • Verify Panel results: ➢ Keep GPS results suppressed • Verify the organism ID *Staphylococcus aureus* • Ensure the quantitation is entered as "Isolated" • The following isolate comment will be added: **&cx00** • In order entry, copy report to OCPHO (HPU1) • In order entry, copy report to appropriate IPAC • In order entry, add ESO code "MRSA"

NOTE: STH IPAC ward is **SIPAC**. IRH IPAC ward is **IIPAC**.

LIMITATIONS:

1. Prolonged exposure to light (>8h) may result in reduced recovery and/or colouration of the QC organisms or patient isolates. Minimize exposure of plates to light both before and during incubation.
2. Incubation in CO_2 may result in false negative cultures. Incubate only in ambient air incubator.
3. Performance of this agar has been optimized for incubation at 35°C to 37°C for 18 to 28 hours. Plates can be read any time within this timeframe. Lower or higher incubation temperatures and/or incubation times <18 hours may reduce the sensitivity of the agar.
4. Pinpoint pinkish colonies or red dots may appear on the agar plates. They should be considered as negative. If in doubt, confirm the identification of those colonies by further testing.
5. Some strains of *Corynebacterium imitans*, *Aerocuccus viridans* and *Staphylococcus cohnii* may develop heterogeneous pinkish colonies with a more intense colouration when in clusters, but colourless when colonies are isolated (which enables differentiation from MRSA colonies). If in doubt, confirm the identification of isolated pinkish colonies by doing a tube coagulase test.
6. Rare methicillin-susceptible *Staphylococcus aureus* (MSSA) strains may grow if their MICs are very close to the resistant breakpoint.

CROSS-REFERENCES:

- MIC60040-Culture Media Quality Control

REFERENCES:

1. Leber, A. (2016). *Clinical microbiology procedures handbook.* (4th ed.) Washington, D.C.: ASM Press
2. Jorgensen J.H., Pfaller M.A., Carroll K.C., Funke G., Landry M.L., Richter S.S., Warnock D.W. (2015). *Manual of Clinical Microbiology, 11th edition*. Washington, D.C: ASM Press
3. Bio-Rad. (2016/03). *MRSASelect II* package insert

APPROVAL:

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Date

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REVISION HISTORY:

REVISION	DATE	Description of Change	REQUESTED BY
1.0	11 Jan 17	Initial Release	L. Steven
2.0	30 Nov 18	Updated to include new Vitek 2 instrument	L. Steven
3.0	30 Dec 21	Procedure reviewed and added to NTHSSA policy template	L. Steven
4.0	31 Aug 22	Updated to reflect new MRSA agar MRSA*Select* II	L. Steven