Ministry of Health

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Acknowledgment

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Acronyms:

BA	Blood agar
CA	Chocolate agar
MAC	MaConkey
ATCC	American Type Culture Collection
H&S	Health and Safety
ID	Identification
IQC	Internal Quality Control
MDRO	Multidrug Resistant Organism
MRSA	Methicillin Resistant Staph. Aureus
SOP	Standard operating procedure
TAT	Turnaround time
WHO	World Health Organization

1. **Purpose**

This procedure provides instructions on how a swab collected from patient's superficial skin (wound, surgical site, line exit site, mucosal area ext.) is processed in microbiology laboratory starting from swab receiving up to result reporting and communication. This procedure is not including eye, ear swabs and deep seated abscess.

2. **Scope**

This document is applicable for all medical laboratories under MOH and other collaborative governmental and non-governmental health institutions.

3. **Definitions:**

3.1 Superficial skin wound: A cut, or laceration, is a tear or opening in the skin that occurs due to an external injury. It can be superficial, affecting only the surface of your skin.

3.2 Traumatic wound is a sudden, unplanned injury that can range from minor, such as a skinned knee, to severe, such as a gunshot wound. Traumatic wounds include abrasions, lacerations, skin tears, bites, burns, and penetrating trauma wounds

4. **Procedure**

4.1. Clinical background:

The skin is colonized by normally non-harmful flora. When the skin is broken as a result of trauma, burns, bites or surgical procedures, colonization with a range of bacteria may occur. Infections of the skin and subcutaneous tissues are caused by a wide range of organisms; however, the majority are caused by *staphylococcus aureus* and *streptococcus* species. Particular organisms are often typically associated with specific clinical conditions in skin and soft tissue infections, however overlaps in clinical presentation do occur. Microbiological cultures are important to establish the causative organism enabling antibiotic sensitivity testing which is essential to ensure optimal treatment regimens.

4.2. Principle:

SOP describes the processing of skin, superficial, non-surgical and surgical wound swabs, from sites accessible without intervention, for the microbiological investigation of skin and superficial soft tissue infections (SSTIs). Laboratories must isolate, identify to species level and carry out susceptibility tests of significant bacterial isolates. For isolates, which are difficult to identify, isolates can be sent to the Central Public Health

Laboratories (CPHL) for full identification by molecular testing modalities (ex MALDITOF or PCR)

4.3. Pre – analytical stage:

4.3.1. Sample:

- Skin swab, swab from superficial, non-surgical and surgical wounds, and swab of pus.
- Preferably, use charcoal swabs.
- Advisable collection of sample is by rolling the swabs over a cleaned skin or wound area after removing the devitalized tissue or exudate exposed to body normal flora.
- Good-quality open wound specimens are defined as having polymorphonuclear leukocytes (PMNs) in the direct smear or a history of diabetes or immune-compromised condition.
- The specimen type and clinical details must therefore be taken into consideration when processing samples. For example, swabs of pus should be investigated in a similar way to pus samples, so in addition to the standard media recommended, supplementary media (i.e., fastidious anaerobic, cooked meat broth or equivalent) is also required for these samples.
- Numbers and frequency of specimens collected are dependent on clinical condition of patient.
- In all cases, efforts should be made to collect specimens prior to initiation of antimicrobial therapy, and only from wounds that are clinically infected, deteriorating or that fail to heal over a long period of time.
- Samples of pus/exudate, if present, are preferred to swabs.
- Specimens should be transported and processed as soon as possible.
- If processing is delayed, refrigeration is preferable to storage at ambient temperature.

4.3.2. Material:

Consumables	Equipment's	Reagents
• Charcoal Swabs • transport bag • glass microscope slides • Sterile plastic loops • Universal containers	• Microscope • Incubators (Aerobic, CO2, Anaerobic, Anaerobic jars) • Automated identification and antimicrobial susceptibility testing machines	• Gram stain reagents • Culture media (Blood, Chocolate, MacConkey, Sabouraud, Muller Hinton, Muller Hinton with blood)

4.3.3. Safety precaution:

- All specimens need to be treated as potentially infectious. Standard procedures for handling of biohazard material must be followed at all times. Universal Precautions must be practiced at all stages of these procedures.

4.3.4. Quality control:

- Check the expiry dates of all media, reagents and stains before use.
- All media, reagents, kits, and stains **MUST** be quality controlled before use.
- Identification tests should be run with appropriate controls.
- Record the quality control results in the appropriate QC sheet.

4.4. Analytical stage:

4.4.1. Sample receipt

- Check proper labelling of specimens (Patient name, ID number, Barcode, Lab Episode number, etc.).
- Receive the swab into Al Shifa system or other Laboratory Information System (LIS).
- Reject improperly labeled sample, samples without corresponding request, unsuitable universal containers, dry swabs, leaked...etc.

- Keep the rejected sample for 24 -48 hrs in room temperature before discarding it.

4.4.2. Specimen processing:

4.4.2.1 Microscopy

- A clean slide should be properly labelled with the sample number
- Swab or pus sample is added by rolling all swab surfaces to ensure maximum detection in the slide
- Gram stain is done immediately and results should be entered into Al Shifa system.
- The Gram stain will be used in evaluation of the collected swab quality.
- Note: a poor-quality specimen shows numerous epithelial cells and no PMNs on gram stain.
- Record the relative number of WBCs, epithelial cells, and bacterial/fungal morphotypes as (+/++/+++) as it is shown in the table:

WBC / HPF **(×40)**	**Bacteria or yeast / HPF** **×100**
0-1 occasional	0-1 occasional
1-5 = scanty	1-5 = scanty
5-10 = +	5-10 = +
10-25 = ++	10-250= ++
≥ 25 = +++	≥ 25 = +++

- Still need to culture the swab regardless of WBC seen as some pts may be already on antimicrobials.

4.4.2.2 Culture and investigations:

- Inoculate each agar plate (as in table below) directly by rolling the swab at inoculum and then streak it all over the plate using sterile plastic loop.

- Ensure the complete surface of the swab is well “rolled” over the initial inoculum area of the plates.
- Incubate the plates as follows:

Clinical details	Specimen	Standard media	Incubation			Culture read	Target organism (s)
			temp. ^{0}C	atmos.	Time		
All conditions	Charcoal Swabs	Blood agar	35-37	5 -10% CO_2	48hr	Daily	• *B haem. Streptococci* • *S. aureus* • In cases of bites or exposure to animals or fresh/salt water: *-Pasteurella spp, Vibrio spp, Aeromonas spp, Bacillus cereus/anthracis ,Strep. Pneumoniae , Eikenella corrodens ,Capnocytophaga , Erysipelothrix*
			35-37	O_2 incubator	48hr	Daily	*Enterobacteriaceae , Pseudomonads*

		MacConkey / CLED					
Traumatic wounds	Charcoal Swabs	Selective anaerobe agar (or Blood agar) with metronidazole 5µg disc	35-37	anaerobic	48 hrs	48 hrs	Anaerobes
Swab of pus	Charcoal Swabs Or universal container	Selective anaerobe agar (or Blood agar) with metronidazole 5µg disc	35-37	O2 incubator	48 hr	48 hr	Any organism
Cellulitis in children Human bites	Charcoal Swabs	Chocolate agar	35-37	5-10% CO_2	48 hr	daily	Fastidious organisms ex *Haemophilus* species

*add Sabouraud agar in case of suspected fungi infection or seen under microscope

4.5. Post – analytical stage:

4.5.1. Interpretation:

- Generally, report up to three microorganisms if any of the following is true:

  a. PMNs presence in the direct smear.

  b. The specimen was collected from a normally sterile site (exudate, line exit site or aspirated pus).

c. The specimen was of good quality (e.g., abundant WBC s , not too small with no epithelial cells present).

d. The organism was seen on the direct smear.

- For more than 3 organisms in either one or all plates, report as mix growth
- For more than 3 organisms and there is doubt, consult microbiologist.
- Identify significant isolates using the identification systems available with the susceptibility testing.
- Assigned microbiologist would be responsible to verify the growth on agar plates after the initial incubation period and ask for sub-culturing and initial identification of organisms.
- Also, will be responsible to communicate significant and urgent preliminary finding to the requesting physician when needed.
- If microbiologist is not around, senior laboratory technician would be responsible to verify the final growth results and communicate with concern ward staff. This communication has to be recorded.
- It's the responsibility of the microbiologist or senior lab technician to contact infection control and prevention team when any Multi Drug Resistance Organism (MDRO) is preliminary or finally identified.

4.5.2. Reporting:

- Final swab culture reports should be entered in the Al Shifa LIS by the laboratory technician and authorized by the medical microbiologist.
- Negative cultures at 48 hrs or longer should be reported by laboratory technician as "No growth after 48 hrs."
- Final report should be authorized without delay while mentioning the growth of each microorganism proceeded with scanty, moderate and heavy accordingly.
- All clinically significant isolates should be identified to species level.
- Any organism considered to be a contaminant may not require identification to species level.

5 Responsibilities

5.1. Responsible staff:

- To ensure the adherence to critical result communication procedure
- To facilitate the alternative channels once needed

5.2. Quality manager /officer

- To follow up the implementation of the procedure
- To monitor regularly communication of critical results and raise non-conformance with corrective action once needed.

5.3. All lab staff:

- To adhere to the procedure.
- To document record and release results as recommended
- To report test failures or incident

6 Document History and Version Control

Version	Description	Review Date
1	Initial Release	May 2026

7 References

Title of book/ journal/ articles/ Website	Author	Year of publication	Page
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