Guidelines on microbiological wound swabbing

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Residential Aged Care Seminar
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• When to collect a wound swab
• How to collect a wound swab
• How to interpret a microbiology wound report
• When to commence antimicrobials
When to collect a wound swab
When to collect a wound swab

• Wound swab microscopy, culture and sensitivity (MC&S) is usually unnecessary for skin and soft tissue infections
  – as particular organisms are often typically associated with specific clinical conditions
  – correct treatment choice is usually predicted by the suggested empirical antimicrobial choice
    • e.g. Therapeutic Guidelines: Antibiotic
  – superficial swabs in the absence of a skin break are usually unrewarding
When to collect a wound swab

- **S. aureus**
  - Impetigo
  - Folliculitis
  - Erysipelas

- **Strep. pyogenes**
  - Cellulitis
  - Necrotizing fasciitis
  - Strep. pyogenes (common)
  - S. aureus (uncommon)
  - H. influenzae (rare)
  - Other
  - Mixed bowel flora
When to collect a wound swab

- Wound swabs **may** be helpful in the detection and aid in treatment choice
  - when wound or infection is **not resolving** as expected or with **adequate** empiric antimicrobial therapy
  - if **atypical** infections are suspected
    - e.g. Mycobacterial, fungal, viral infections

- Cultures may be undertaken to enable **sensitivity** testing
  - to ensure **optimal** treatment regimens, e.g. MRSA
When to collect a wound swab

• Wounds should only be cultured when *signs and symptoms* of a deep infection are present

• If an **open wound** or broken skin
  – swabs can be taken from the infected area

• If a **closed wound** or abscess present
  – pus in syringe is preferable to a swab
When to collect a wound swab
When to collect a wound swab

- Many conditions are best diagnosed by a skin biopsy for culture and histopathological examination.

![Image of mucormycosis]
How to collect a wound swab
If a swab is absolutely necessary

- Explain the procedure to the patient and seek consent
- Put on apron
- Wash hands
- Assemble equipment
- Advise the patient to assume appropriate position
  - ensure patient comfortable
  - assist if necessary
- Put on gloves
- Open swab packet as far as will enable removing the swab without contaminating it
  - remove top from transport container
- Take swab appropriately for type to be obtained
  - check directions or with pathology provider
- Put swab in transport container, ensure securely placed
- Remove gloves and apron
- Wash hands
- Label swab container
- Complete request form
- Document in notes
- Send swab and form to laboratory
How to collect a wound swab
How to collect a wound swab

• If an open wound or ulcer, sample a representative part of the lesion
  – swabbing dry crusted areas is unlikely to yield the causative pathogen
  – any debris or surface exudate should be removed and the ulcer should be cleaned with sterile saline
  – pass swab deep into lesion and firmly sample lesions advancing edge
  – a biopsy or a needle aspiration of the edge of the wound should be taken if able
How to collect a wound swab

• If a **closed wound or abscess** present
  – aspirate material with needle and syringe is preferred
  – the area should be decontaminated as much as possible before the material is aspirated
How to collect a wound swab

• Collect specimens **before** starting therapy if possible

• If **atypical organism** culture is required
  – this information should be provided on the request form

• Swabs for bacterial (aerobic or anaerobic), viral and fungal cultures should then be placed in **appropriate transport medium**
How to interpret a microbiology wound report
How to interpret a report

- Normal skin and therefore skin wounds, have a mixture of different bacteria, this is called **colonisation**
  - which are often **harmless**
  - **do not** require treatment

- When the skin is broken as a result of trauma, burns, bites or surgical procedures
  - **colonisation** with a range of these bacteria may occur
How to interpret a report

• It is important to think carefully about the **likely significance** of the results of cultures from wound swabs
  – to avoid **over-treating** patients with antibiotics
    • you **do not** have to treat everything that is cultured
    • pure growth of a single organism **increases the likelihood** that it is the pathogen
How to interpret a report

Collected: 01/01/2018 - 12:00 AM  Notified by: on 00/00/0000
Reported: 13/01/2018  Message:

============================================================================
Report data as at: 14:34:14  03 Jan 2018 For REQUEST on 01 Jan 2018
--------------------------------------------------------------------------
MICROBIOLOGY REPORT
REPORT STATUS: FINAL
SPECIMEN: Swab  SITE: Right forearm skin
GRAM STAIN:
   White blood cells : few  Epithelial cells : +++
   Gram positive cocci : ++  Gram negative cocci :
CULTURE:
   Staphylococcus aureus ++
SENSITIVITIES:
   Penicillin R  Flucloxacillin S  Erythromycin R
How to interpret a report

- If there is a high *white cell, polymorph* or *pus cell* count, ++ or +++
  - this *suggests* a wound infection may be present

- If ++ or +++ Gram negative or Gram positive bacteria are seen on *microscopy*,
  - this is more likely to be a *true infection*
How to interpret a report

• If there is a **colony count** of $>10^6$/L, ++ or +++ of a bacteria
  – this is more likely to be a **true infection**

• Growth of more than one bacteria species suggests
  – possible **contamination / colonisation**
How to interpret a report

• Common **colonisers** and **contaminants**
  – alpha haemolytic streptococci
  – coagulase negative Staph.
  – Corynebacterium spp.
  – Propionibacterium spp.
  – Bacillus spp.
How to interpret a report

- Common pathogenic organisms
  - *Streptococcus pyogenes*
  - *Staphylococcus aureus*
  - Enterococcus spp.
  - *Clostridium perfringens*
  - *Pseudomonas aeruginosa*
  - *Enterobacteriaceae*, e.g. *E.coli*, Klebsiella spp.
  - Fungi (Candida albicans)
How to interpret a report

• If the patient is receiving an antimicrobial that is reported as **resistant (R)** or **intermediate (I)**
  – this may need to be changed to one that is reported as **susceptible (S)**

• If there is **more than one** that is **susceptible (S)**
  – the patient should be prescribed the one with the **narrowest spectrum**
    • prudent use of antimicrobials according to local and national protocols is recommended
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When to commence antimicrobials
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- All **chronic wounds** are colonised by bacteria
  - wound healing occurs in the **presence** of bacteria
  - certain bacteria appear to **aid wound healing**

- It is not the presence of organisms but their **interaction** with the patient that determines their influence on wound healing
When to commence antimicrobials

- After about 4 weeks
  - facultative anaerobic Gram negative rods will *colonise* the wound
    - e.g. *Proteus, E. coli, and Klebsiella*
  - organisms like *Pseudomonas* are *not very* invasive
    - unless the patient is highly *compromised*
  - as the wound *deteriorates* deeper structures are affected
    - anaerobes become more common
    - infections become polymicrobial
When to commence antimicrobials

• The decision to treat a wound infection should be made on **clinical grounds**
  – **not** based on the results of a wound swab

• Antibiotic treatment may be appropriate for infection which is **spreading**
  – especially where **systemic toxicity** is present
  – for less serious infection, simple **cleaning or drainage** may be sufficient
When to commence antimicrobials

- Systemic **signs and symptoms** of infection:
  - fever
  - feeling unwell, nausea
  - purulent discharge
  - increasing or continual pain
  - redness or tracking around the area
  - swelling around the area
  - heat around the area
  - loss of function or movement

- Systemic factors that **increase** chances of infection:
  - vascular disease
  - oedema
  - malnutrition
  - diabetes
  - alcoholism
  - prior surgery or radiation
  - corticosteroids
  - inherited neutrophil defects
Summary

• Wound swabs are rarely indicated
  – even in the presence of infection they are often unhelpful
  – clinical review and empirical guidelines are more helpful
    • follow Therapeutic Guidelines: Antibiotic or local wound care manuals

• Wound swab reports need to be interpreted correctly
  – do not treat all organisms isolated
  – clinical review needs be included for interpretation
Thank you