

## Introduction

Wound swabbing is a commonly undertaken procedure that can be useful in identifying the bacterial burden within a wound and recommending appropriate systemic therapy.

The technique of wound swabbing most commonly used by practitioners is a semi-quantitative swab. In this procedure a cotton tipped swab is used to sample exudate from the surface of a wound. The swab is inoculated on standard media in a petri dish and streaked into four quadrants (Dow, Browne and Sibbald 1999). Whilst this is a quick and relatively inexpensive sampling technique that can produce good correlation with quantitative biopsy results, there is some reduction in specificity and inadequate wound bed preparation can result in the identification of surface colonisers, rather than the pathogens responsible for an infection (Dow et al 1999).

A wound infection can increase the length of hospital stay by ten days (Cruse and Foord 1980). Many more wounds in the community are treated for the clinical indicators of infection, however the incidence of community acquired wound infections is not well documented. It has also been recognised that many chronic wounds have an altered biological microenvironment that requires correction in order for healing to progress (Falanga 2001).

There are a number of definitions used in relation to bacterial burden in wounds and it is important that the practitioner understands these:

**Contamination:** The presence of organisms in a wound that are not multiplying.

**Colonisation:** The presence of organisms in a wound that are multiplying but causing negligible host reaction. Colonisation can have a detrimental effect on wound healing, but as the 'classic' signs of infection do not accompany it, is often not identified.

**Infection:** The presence of organisms in a wound that are multiplying and causing a host reaction. In laboratory terms this is often defined as an organism count of greater than  $10^5$  per gram of tissue. (Donovan 1998)

## Wound Assessment

If a wound infection is suspected, a comprehensive, systematic and documented assessment of the client and wound should be undertaken to confirm this. Identification of the sensitivities of organisms should occur prior to making wound management decisions regarding infected wounds (Donovan 1998).

*Possible indicators of wound infection:*

- Delayed wound healing

- Purulent discharge from the wound
  - Green, yellow or brown wound exudate
  - Increased amount of wound exudate
  - Offensive odour
  - Inflammation and erythema of the wound and surrounding tissue –may include cellulitis (*Note: persons with diabetes may not experience this*)
  - Hypergranulation tissue
  - Elevated body temperature / fever
  - General malaise / lethargy
  - Increased or unusual pain (*Note: persons with diabetes may not experience this*)
  - Confusion
  - Elevated blood glucose level in persons with diabetes
  - Leucocytosis
- (Adapted from Cutting and Harding 1994 in Donovan 1998)

## Indications for Wound Swabbing

A wound swab should generally only be taken when there are clinical signs of infection (Gilchrist 2000; Kieran 1998). The presence of slough or necrotic tissue is not a reason for taking a swab. Swabs from these areas may reflect the products of devitalised tissues and not the organisms causing an infection (Kieran 1998). Areas of devitalised tissue need to be removed and this may be achieved through a number of debridement methods including autolytic, sharp, mechanical, enzymatic or biological. Wound swabs will only sample the surface of a wound. A swab is hardly ever as useful as tissue, pus or fresh exudate (Gilchrist 2000; Cooper and Lawrence 1996; Hedges 1993).

Wounds that are colonised will generally heal without requiring antibiotics. There are a number of products available on the market to reduce bacterial burden in heavily colonised wounds including cadexomer iodine and silver containing dressings.

## Consultation / Liaison

If a nurse is initiating a wound swab it is recommended that consultation with the treating medical officer is undertaken prior to the swab being taken. In cases of deep infection or where specific pathogens are suspected, it is advised that consultation with the pathology laboratory occurs prior to taking the swab to ensure it is collected, stored and transported appropriately (Gilchrist 2000).

When completing a request form for analysis of a wound swab as much information as possible should be included to assist the laboratory. Accurate wound description will ensure accurate findings. If a pathology request form is not available, the following details should be provided to the treating Medical Officer, in writing with the swab, to ensure they can complete the request form with adequate detail:

- Date and time of specimen collection

- Diagnosis

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*This issue researched by Sue Templeton, Advanced Wound Specialist, RDNS Special Programs Division.  
Edited by Professor Tina Koch and Natalie Howard, RDNS Research Unit.*

Contact Details: Research Coordinator, *RDNS Research Unit*, PO Box 247, GLENSIDE SA 5065, Ph: (08) 8206 0111,  
Fax (08) 8206 0010, Email: [howard.natalie@rdns.sa.gov.au](mailto:howard.natalie@rdns.sa.gov.au), Web: <http://www.rdns.net.au> (newsletter available on website)

- Signs that have led the practitioner to suspect infection is present
- Type of wound
- Specific wound site
- Type of specimen / wound tissue
- Examination requested
- Any current topical or systemic wound treatment (Kiernan 1998; Cuzzell 1993)

### Principles of taking a wound swab

NB: No particular method of wound swabbing can be considered definitive, however the literature recommends the following:

Principle	Rationale
Wound swabs should be taken from an area of viable tissue where the clinical signs of infection are present ie. Do not swab eschar or yellow, fibrous slough (Kiernan 1998; Cuzzell 1993).	Infection causing organisms are most likely to be found in viable tissue.
Do not culture pooled exudate or wound dressings (Cuzzell 1993)	Risk of non-wound contaminants is high.
Antiseptic solutions should not have been used prior to taking wound swab (Kiernan 1998; Cuzzell 1993).	Organisms will be killed, and a false negative result may occur (Cuzzell 1993)
Swabs should be taken prior to the client commencing systemic antibiotic therapy.	Antibiotic therapy can adversely affect swab results (Gilchrist1996).
Local anaesthetic should not be used prior to taking a swab.	Local anaesthetics can demonstrate antibacterial effects (Gilchrist 1996).
Avoid surrounding skin (Kiernan 1998; Cuzzell 1993).	Will avoid introducing superficial skin organisms into the culture.
If fresh pus or wound fluid is present collect this (Kiernan 1998; Gilchrist 2000).	Will allow the most accurate estimation of organism type/s and load
Remove excessive debris and all dressing residue without unduly disturbing the wound surface using a gentle stream of normal saline (Lawrence 1999; Donovan 1998; Cooper and Lawrence 1996).	Surface organisms are often different to those causing the wound infection and skin cells and other harmless contaminants may be present on the wound surface (Cuzzell1993).
Wait for 1-2 minutes before taking swab (Lawrence 1999). If wound is fairly dry, moisten swab with sterile normal saline, if wound is moist swab can be used dry.	Allows organisms to rise to the surface of the wound. Maximisation of uptake of exudate by swab.
Use a zig-zag motion to swab wound surface and rotate swab during swabbing (Donovan1998; Lawrence 1999). Whole wound surface should be swabbed. If wound is very large, swabbing a number of small areas is acceptable (Lawrence2000).	Will allow for most complete sampling of wound organisms.
Transport swab to pathology laboratory as quickly as possible. If a delay of more than 24 hours is expected between taking a wound swab and arrival at the laboratory it is advised to store the swab in a refrigerator at 4°C (Cooper and Lawrence 1996)	Assists in preservation of Common wound bacteria.

Falanga, V. 2001, *Science of Wound Management: Wound Bed Preparation*, Smith and Nephew, Hull, England.

### Other methods for wound sampling

A wound swab is not the best method for obtaining a quantitative sample of the organisms within a wound. Biopsy or deep tissue aspiration is much more accurate, however not this is often not practical. If deep infection is suspected, consultation with the treating Medical Officer and/or laboratory should occur as to the best method of wound sampling (Gilchrist 1996).

### Client education

Clients should be informed as to the results of wound swabs and the implications of this in relation to treatments and outcomes. Isolation of multi-resistant organisms should be recorded according to organisational protocols.

### Conclusion

With careful assessment, accurate diagnosis and appropriate treatment the effects of wound infection can be minimised and optimal client outcomes achieved. Wound swabbing is one tool that can be used to assist in client management.

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