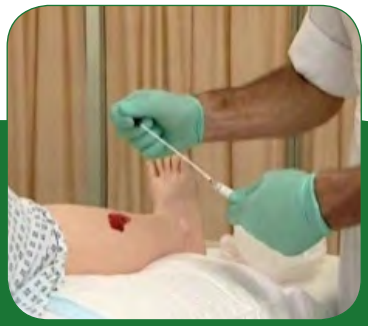


How to...
Ten top tips for taking a wound swab

Author:
Rose Cooper

Useful links

Video – How to take a wound swab

Methods of obtaining a specimen from a wound include wound swabbing, needle aspiration and wound tissue biopsy. Although wound swabbing is the most practical and widely used, it is important to use a technique that produces reliable samples for microbiological analysis. **In this practical guide, Rose Cooper offers tips for when and how to take a wound swab, using an established technique.**

WHEN TO TAKE A WOUND SWAB

The technique usually employed for transferring clinical samples from wounds to microbiology laboratories is the wound swab; however definitive guidelines for this relatively simple procedure have yet to be established. Uncertainty about when swabs should be taken, the correct collection procedure and the appropriate protocols for submitting swabs for investigation have led to a situation where clinicians regularly collect and process unsuitable samples.

Wound infection is normally diagnosed on clinical criteria (classical signs and symptoms, as well as odour and increased exudate), rather than bacteriological criteria, as wounds may be colonised by microbial species without any adverse effect on healing. Therefore routine microbiological investigation is not justified[1,2].

However, laboratory investigation does provide clinicians with information about the organisms present in a wound and their antibiotic sensitivities, which can inform decisions about future management strategies.

Swabs should therefore be collected only when clinical criteria point to a wound infection and before any antimicrobial interventions have been initiated.

HOW TO TAKE A WOUND SWAB

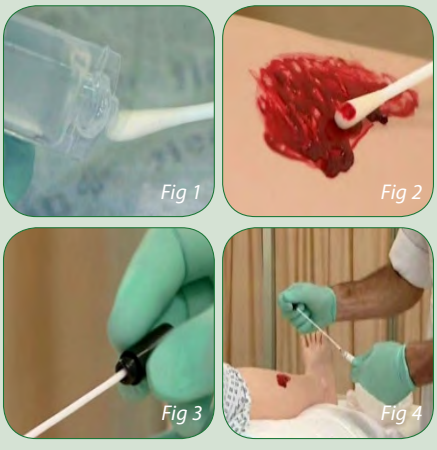
It should be noted that the best technique for swabbing wounds has not been identified and validated. The following recommendations can be used as a guide and should be used in conjunction with local protocols:

1 When a swab is indicated, the patient should be given a concise explanation of the need for microbiological investigation and what the procedure involves, for example, that swabs are mainly used to recover species from the surface layers rather than from the deep tissues of a wound.

2 Before a representative sample is collected, any contaminating materials such as slough, necrotic tissue, dried exudate and dressing residue should be removed by cleansing the wound with tap water, sterile saline or debridement.

3 Sterile swabs with cotton or rayon tips are usually used. If the wound is moist a swab can be used straight from the packaging – if the wound is dry, then the swab tip should be moistened with sterile saline to increase the chances of recovering organisms from the site *[Fig 1]*. Swabs with a transport medium that incorporates charcoal enhance the survival of fastidious organisms[3].

4 Care should be taken to ensure that the swab only comes into contact with the wound surface.



Figures 1–4: Step by step guide to taking a wound swab

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5 The swab should be moved across the wound surface in a zig-zag motion *[Fig 2]*, at the same time as being rotated between the fingers *[Fig 3]*. Downward pressure to release fluid from the wound surface has been advocated[4], but this may be painful for the patient.

6 A representative area of the wound should be sampled. If the wound is large, it may not be feasible to cover the entire surface, but at least 1cm^2 should be sampled and material from both the wound bed and wound margin should be collected. If pus is present, the clinician should ensure that a sample is sent to the laboratory.

7 Immediately following collection, the swab should be returned to its container (placed into the transport medium) and accurately labelled *[Fig 4]*.

8 Any supporting documentation for the laboratory should immediately be completed and a note included in the patient's records. It is important to provide information to the laboratory staff that will aid their use of the standard operating protocol, such as any underlying co-morbidities, the patient's age, ongoing treatment and wound location[5].

9 Swabs must be transferred to the laboratory as quickly as possible and ideally processed within four hours of collection.

10 The laboratory report should list the potential pathogens isolated and the amount of growth observed. The antibiotic susceptibilities of any organisms present in the wound may be included, but whether the isolates are of clinical significance or whether antibiotic therapy is required is a matter of clinical judgement. Spreading cellulitis and clinical infections will require systemic antibiotics[6].

AUTHOR DETAILS

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Expert Commentary

Sue Gardner, Associate Professor, College of Nursing, The University of Iowa, USA

Rose Cooper describes two techniques to obtain swab specimens for wound culture: the Z-technique and wound exudate. These two swab techniques are commonly advocated in the literature in addition to a technique described by Levine et al*[1]. Swabs of wound exudate, including pus, are self-descriptive and are usually taken prior to wound cleansing. Conversely, wound cleansing is advocated prior to obtaining swabs using the Z-technique or Levine's technique. Swabs using the Z-technique entail rotating the swab between the fingers as the wound is swabbed from margin to margin in a 10-point zigzag fashion. The Levine technique consists of rotating a swab over a 1cm^2 area with sufficient pressure to express fluid from within the wound tissue.* ***Theoretically, the swab technique that most accurately reflects wound 'tissue' bioburden, rather than surface contamination, provides the most clinically meaningful information.***

Three swab techniques (wound exudate, Z-technique, and Levine's) have been examined and compared for concordance of microbial species isolated as well as for their diagnostic validity in quantifying the number of microbes per swab as compared to quantitative tissue cultures[2]. Cooper has based her swab technique suggestion on the view that wound cultures are obtained primarily to provide data regarding the type of organisms present and their antibiotic sensitivities to guide treatment, not to diagnose wound infection. She contends, as others[3], that wound infection is diagnosed based on clinical rather than microbiological data. In this context, analyses of the concordance of swab specimens with tissue cultures in isolating microbial species provide insight into the utility of swab techniques used for this purpose only. Although swabs based on wound exudate and the Z-technique demonstrated high concordance with wound tissue cultures[2], Levine's technique performed slightly better than both wound exudate and Z-technique for isolating specific pathogens.

While some experts believe cultures should not be used to diagnose wound infection, definitions of infection based on microbial load (ie quantity of organisms per gram of tissue or swab) are widely accepted[4]. Although inflammatory responses are the first line of defense against microbial invasion and the first indication of infection, many chronic wounds do not express these signs of clinical infection despite high microbial load and/or the presence of pathogenic organisms[5]. To examine the diagnostic validity of swab techniques, analyses of the accuracy as compared to tissue cultures in identifying microbial load provide insight into the utility of swab techniques used for this purpose. The accuracy of swab specimens based on Levine's technique was significantly higher than those based on Z-technique and approached significance when compared to swabs based on wound exudates[2].

Based on a systematic review, Bonham[6] developed a clinical guideline for swab cultures, in which he proposes the use of Levine's technique, including cleansing the wound bed of non-adherent debris, sampling over viable tissue and as near the centre of the wound as possible. This work represents a comprehensive synthesis of the literature on swab technique practices.

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