

A survey of clinicians' perceptions of, and product choices for, the infected wound

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Abstract

In today's health system, nursing has broadened its considerable expertise, resulting in an increase in the number and variety of specialities within clinical practice. Two essential practices that have been affected by this need for increased specialist knowledge are wound management and infection prevention and control. In many facilities both speciality practices are managed by nurses and midwives who hold speciality qualifications and are considered experts in their practice areas. However, if this level of expertise is not available, it is the responsibility of the ward clinicians to assess and manage wounds and prevent and control infections.

Introduction

Nurses and midwives play a vital role in infection control and prevention practices¹. While monitoring and surveillance of infections has increased with the advent of specialist practice, hand washing remains a significant problem within today's healthcare setting². It is recognised that contaminated hands and failure to practice hand hygiene are primary contributors to infection in healthcare settings³.

While healthcare practitioners are aware of the rationale for hand hygiene, hand washing occurs in approximately half the instances it should and is of a shorter duration than recommended³. According to Larson (1995) the main motivating factor for hand washing remains awareness by the practitioner of its importance. Nurses and midwives have a professional responsibility not only to prevent infection through such practices such as hand washing but also to recognise episodes of infection and manage them appropriately.

Wound infection can cause systemic problems, delay healing and prolong hospital stays^{4,5}. In wound management, specifically in the case of the infected wound, accurate knowledge and assessment skills are required⁶. The consequences of infected wounds present considerable challenges for clinicians, especially those not expert, particularly with respect to identification, decisions surrounding wound swabbing and choosing an appropriate product to dress the wound⁷. In the past 30 years, major advancements in our understanding of the factors that influence healing have resulted in a proliferation of dressing products. For the non-expert this may result in confusion in relation to the choice of the correct product and the appropriate management strategy for a particular situation.

Using consistent language in defining or describing infection in different types of wounds can only provide a clearer guidance for patient care, faster intervention, reduced patient mortality and lower financial costs to health services^{8,9}. From a clinical management perspective, in the first instance it is the recognition of the state of the wound with respect to the infection status that is the challenge.

In 2005 the European Wound Management Association (EWMA) published results from a Delphi study in which a recognised panel of wound care experts developed a consensus opinion on criteria for identifying infected wound types. This clinical identification or language was described as "clinical indicators"⁹.

The benefits of clarifying and defining clear clinical signs of wound infection can only amplify precision in the identification of wound infection; however, little is known as to what descriptive language (clinical indicators) nurses and midwives use to identify an infected wound and whether

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or not the language is similar or different to that of experts. This information is an important first step to developing appropriate education resources for clinicians. Four specific infected wounds types have been chosen for this study – acute wound, diabetic foot ulcer, venous leg ulcer and pressure injury (ulcer).

Wound dressings are employed to absorb wound secretions, protect the wound from injury and protect against bacterial infection¹⁰. The choice of dressing must be determined after assessing the needs of the person and the current state and type of the wound. However, no dressing product is suitable for every wound or every person¹¹ and this brings, at times, confusion for the clinician.

In summary, nurses and midwives are crucial members of the healthcare team in relation to infection prevention and control and wound management. A better understanding of the choices they make in relation to preventing infection, as well as identifying, documenting and managing the infected wound, is the first step in identifying the need for educational resources to support best practice.

Therefore, the aims of this study were to explore the following questions:

- What infection prevention and control practices do nurses and midwives use when managing the infected wound (hand washing; wound swab; communication and documentation)?
- What language (using clinical indicators) do nurses and midwives use to describe specific infected wounds?
- What products do nurses and midwives choose to manage specific infected wounds?

Method

Design

The design of this research project was a descriptive exploratory study. A self-administered questionnaire was chosen as the method for collecting data.

Instrument

A survey tool was designed by the investigators based on the review of the literature and the clinical expertise of the group. The range of language choices used to describe the four wound types was based on the highest-ranking clinical indicators from the EWMA published position document. The range of product choices was based on best practice guidelines outlined in Carville (2005).

To explore the knowledge base of the participants, two definitions were given in the survey. The definitions used to

classify infected and colonised wounds were taken from the EWMA published position document¹².

- Infected wound: microbial growth, multiplication and invasion into host tissue leads to cellular injury and overt host immunological reactions. Wound healing is interrupted.
- Colonised wound: microbial species successfully grow and divide, but do not cause damage to the host or initiate wound infection.

Fixed response items were used to gather data regarding language and product choices, demographic characteristics, educational background and infection control practices of the participants.

Face validity

Face validity refers to the subjective judgement of whether or not the research instrument appears to measure what it is supposed to measure¹². Face validity was ensured by constructing questions relevant to the research study. Feedback was sought throughout the development phase of the questionnaire from the infection prevention and control educators, wound care nurses and researchers. Once the questionnaire was completed it was pilot tested for clarity and was amended based on the feedback.

Sample

The target population for this survey were clinical nurses, midwives, student nurses, enrolled nurses and agency staff working in a 500-bed tertiary facility.

Ethics

Approval for the study was received from the Australian Capital Territory Human Research Ethics Committee (No ETH.9/06.669).

Data collection

Clinicians in acute care wards were invited to participate in the survey through their ward areas. This was achieved by a display of posters explaining the survey and information sessions inviting participation. The survey was distributed for a 2 week period. The surveys were anonymous, and when completed were returned in a self-addressed envelope through the hospital's internal mail system.

Data analysis

The software package SPSS 11.5 version was used to analyse the data. This survey was exploratory in nature and generated nominal data, therefore descriptive non-parametric statistical techniques were used for analysis. Frequency distributions were used to describe participant characteristics, clinical

indicators, product choices, educational background and infection control knowledge.

Results

Demographic characteristics of participants

Two major groups of clinicians responded to the survey. A total of 87% were registered nurses or midwives and 12% were enrolled nurses. Just of half (56%, n=99) of the respondents worked full time and 39% (n=70) worked part-time (Table 1). Responses to the survey were spread across all work areas and participants' experience in the workforce since graduation ranged from 5 months to 35 years, with an average of 13 years.

Clinical indicators used in current practice to describe specific infected wounds

In this series of questions, respondents (n=178) were asked to identify all the clinical indicators they would use to describe four infected wound types (acute wound, diabetic foot ulcer, venous foot ulcer and pressure injury). Respondents had a choice of eight clinical indicators for each type from which to choose, therefore percentages are less than 100%. The indicators were malodour, pain, delay in healing,

Table 1. Participant characteristics.

Characteristic	Responses (n=178)
Classification	
Registered nurse/registered midwife	155 (87%)
Enrolled nurse	22 (12%)
Missing data	1 (0.00%)
Work area	
Medical	44 (25%)
Surgical	43 (24%)
Women's and children's health	36 (20%)
Aged care and rehabilitation services	5 (3%)
Regional cancer service	1 (0.5%)
Outpatient clinics /HITH*	10 (5.5%)
Other#	38 (21.5%)
Missing data	1 (0.5%)
Employment status	
Full-time	99 (56%)
Part-time	70 (39%)
Missing data	9 (5%)
Years since graduation	
Mean	13 (SD =10.06)
Range in years	<1-35

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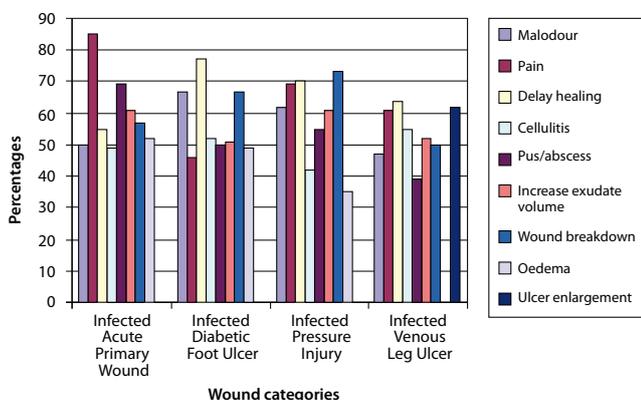


cellulitis, pus/abscess, an increase in exudate volume, wound breakdown, oedema and ulcer enlargement.

For the infected acute primary wound, the most frequently chosen clinical indicators (using percentages) were pain at 82%, followed by pus/abscess development (69%), and an increase in exudate volume (61%). For the infected diabetic foot ulcer, delayed healing was the most frequently indicated clinical sign at 78%, followed by wound breakdown (67%), and malodour (67%).

Delayed healing (63%) and ulcer enlargement (63%) were the most frequently chosen indicators for an infected venous leg ulcer, followed by pain (61%) and cellulitis (55%). For the infected pressure injury, wound breakdown (73%), pain (69%) and delayed healing (68%) were the chosen indicators (Figure 1).

Figure 1. Clinical indicators (%) identified with infected wound categories.



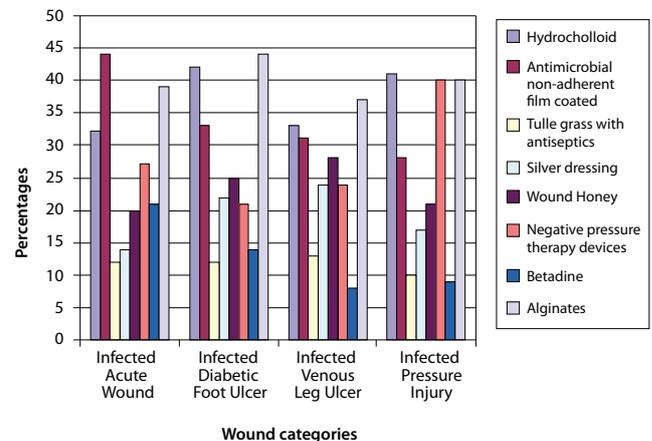
Wound care products chosen to manage specific infected wounds

Nurses were then asked to identify their choices of dressing products for each infected wound type. Respondents (n=178) were encouraged to identify all possible choices from the eight listed products, therefore percentage totals are greater than 100%.

For the infected acute primary wound, the most frequently chosen wound care products were an antimicrobial non-adherent film coated dressing (44%) followed by (calcium) alginate (38%) and hydrocolloid (32%). A total of 44% of nurses identified alginate as a dressing choice for an infected diabetic foot ulcer followed by a hydrocolloid dressing (42%) and antimicrobial non-adherent film coated dressing (33%).

Alginate was again the most frequently identified dressing product for an infected venous leg ulcer (37%), followed by hydrocolloid and an antimicrobial non-adherent film coated dressing at 33% and 31% respectively. For the infected pressure injury, the most frequently chosen dressing was a hydrocolloid product (41%) followed by alginate and negative pressure therapy devices – VAC® (40%). Frequencies for all product choices are outlined in Figure 2.

Figure 2. Nurses' product choices (%) for the four infected wound categories (n=178).



Knowledge of infection prevention and control practices

Two questions explored the respondents' infection prevention and control practices. Definitions of colonisation and infection were correctly identified by 96% (n=169) and 97% (n=172) of respondents respectively. A total of 59% (n=105) of respondents used more than one variety of hand wash. Antimicrobial hand wash followed by liquid soap were the most commonly used agents; only 2% of respondents used an alcohol hand rub.

Communication practices

When a wound showed signs of infection, 93% (n=165/178) of respondents stated they obtained a wound swab and 68% (n=122/178) stated that they would notify the medical officer. However, only 7% (n=12/178) stated they would notify an infection control practitioner. Over 13% (n=23/178) of respondents notified more than one person/team including the clinical nurse/midwife consultant (CNC/CMC) in their own ward area, and a colleague and or other members of the interdisciplinary team managing the patient. Documentation in the clinical notes was also used as a form of communication with other members of the team.

Documentation practices

A total of 41% (n=73/178) of respondents used a wound assessment form as a means of documenting the type and choice of dressing product when caring for a patient with an infected wound. Further, 44% of nurses/midwives (n=78/178) also used tracings to record the extent of the wound, while 24% (n=42/178) of nurses/midwives stated they used digital photography. Comments were made regarding difficulties in gaining access to or owning a camera within their clinical areas.

What educational resources do nurses/midwives use to inform their wound management practices in relation to infected wounds?

Only five respondents had a post-graduate qualification in wound management; however, 13% (n=24) stated they had completed wound management modules during their undergraduate courses, all within the past 6 years. A total of 12% (n=22) of nurses/midwives identified educational meetings, seminars or conferences as their main source of information regarding wound management, while 30% had completed wound care modules offered by the facility, again within the past 6 years.

A total of 72% of respondents (n=84) stated they used wound management nursing practice standards to inform their clinical management of infected wounds. Additionally, 52% of nurses/midwives used a combination of other tools or expert opinion, mainly senior nursing/midwifery colleagues, to inform their practice. The *Wound Care Manual*¹¹ was reported to be extensively used as a resource by nurses and midwives across all areas in the facility.

Discussion

This survey aimed to capture the language used by nurses/midwives to describe specific infected wounds as well as the products they routinely chose to dress the wounds. In addition, it sought information on practices they used to prevent and control wound infections.

Sample

Participants in the survey represented a wide range of clinical practice areas within an acute care facility. As a group, few held recognised post-graduate education in wound care and infection control and prevention practices; however, at least one third had participated in wound care modules offered by the facility, with a further one third stating they had attended seminars and/or conferences on wound management and infection control and prevention within the past 6 years.

Although it was not possible to compare the demographics of the respondents with the demographics of the facility's nursing and midwifery workforce as a whole, it would appear that the group were reasonably reflective in terms of experience and employment status.

Response rates

Low response rates are a significant problem in survey research. Response rates of 25-30% for mailed questionnaires are common; however, a rate lower than 50%¹³ places the representativeness of the sample in question. At 17% (178/1038) the response rate for this survey was low; however, it was considered sufficient to gather baseline data and draw some conclusions in relation to the aims of the study. However, we do acknowledge that the results may not be reflective of the practices of nurses and midwives at the facility as a whole.

Infection prevention and control practices for managing the infected wound (hand washing; wound swab; communication and documentation)

Hand washing products are now diverse in range. In this study, a majority of the respondents used more than one variety of hand wash (liquid soap, antimicrobial wash or alcohol hand rub). This range of hand washing products is also evident in the procedural policies and manuals for hand hygiene practices. In general hand hygiene practices, liquid soap is recommended; however, for procedural hand hygiene practices, antimicrobial agents or alcohol-based hand rub is recommended. While we did not ask the participants the reasons underpinning their choice, location of these products within the clinical areas does not seem to have influenced the choice they made. In this facility, alcohol hand rub is located at both the room entry and the ends of the beds in adult areas, making it the most accessible product but the least used. In contrast, antimicrobial wash and liquid soap containers are located over the sink outside each room.

Best practice in both wound management and infection prevention and control requires the use of assessment tools, documentation and communication¹³. In this study, nurses and midwives took a wound swab and documented and communicated their findings. The majority notified the medical officer; however, only a small number (8%) notified the infection control and prevention practitioners¹⁵. This is concerning and the reasons behind this should be explored in subsequent research.

Clear documentation of wound management informs the progression of healing¹². Respondents used a wound assessment form as part of practice less than 50% of the time. Without clear documentation of healing progression and

product choice, the management plan for optimal wound healing is indistinct. Nurses and midwives indicated they favoured the use of adjunct tools in practice such as tracing and digital photography. However, several indicated that they experienced difficulties in gaining access to this specialist equipment.

Language (clinical indicators) nurses use to describe specific infected wounds

The results of this survey provide an insight into descriptive language (clinical indicators) clinicians use to describe specific wound types such as acute primary wound, diabetic foot ulcer, and venous leg ulcer and pressure injuries.

Experts consistently chose cellulitis as the most important clinical indicator of infection in all wound types⁹. In contrast, nurses and midwives used cellulitis as a clinical indicator, however, did not choose to give it significant ranking as the experts. The clinical indicators routinely used by respondents in the other infected wound types (acute primary wound [pain], diabetic foot ulcer [malodour, delayed healing], venous leg ulcer [delayed healing, ulcer enlargement] and pressure injury [wound breakdown and delayed healing]) were considered less important by the experts.

Expanding nurses' and midwives' repertoire of clinical indicators and emphasising the importance of cellulitis as a cardinal indicator of infection could result in better practice outcomes.

Products used by nurses to manage specific infected wounds

The choice of dressing must be determined after assessing the needs of the person and the current state of the wound and wound type¹¹.

In this study, nurses and midwives were given a selection of eight products which could be used for the particular infected wound type. Despite the technological advancement in wound products that are available for nurses and midwives, traditional dressings such as calcium alginate and hydrocolloid were the two highest ranked dressings of choice for all four wound groups. Importantly, hydrocolloid products are not recommended for wounds clinically infected with anaerobic bacteria¹¹. Modern dressing products such as silver-based dressings and negative pressure therapy device – VAC therapy® – did not rank as high as traditional dressings, suggesting lack of confidence, knowledge or support in using these dressings of choice. However, access to speciality wound products for clinicians and midwives is often limited and not readily available from clinical store rooms. Speciality orders require additional administrative processes, time and

Table 2. Clinical Indicators.

Malodour
Pain
Delay healing
Cellulitis
Pus / abscess
Increase exudate volume
Wound breakdown
Oedema
Ulcer enlargement

additional costs implications on the clinical services which were not explored as part of this survey.

The Australian Wound Management Association (AWMA) Standards for Wound Management identify the importance of clinical decision making around wound management practices¹⁴. Evidence-based wound management standards were used as a reference by 72% of the nurses and midwives responding to the survey. However, over 50% used senior nursing or midwifery colleagues' opinion when dealing with management decisions regarding the infected wound. This finding highlights the importance these nurses and midwives placed on using the expertise of colleagues. More mentoring in relation to managing infected wounds may result in improved practice.

Conclusions

Despite the limitations of the survey and responses, this study has provided valuable information regarding nurses' and midwives' practices when confronted with the infected wound.

There is a need to develop levels of champions in speciality clinical areas for both wound management and infection and prevention and control practices within the acute care setting, with further support by experts in the field. An evidence-base approach to practice management needs to be provided through policies, practice standards and adjunct tools. Dressing product choices need to be diverse to meet clinical needs, as does educational support to meet specifically the science, technique and application needs in this highly challenging and changing area of practice.

Developing a common language through the use of clinical indicators may help to avoid difficulties in the diagnosis and management of infected wounds for both clinician and expert, thereby improving patient outcomes.

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