

# Central venous catheter exit site dressings: Balancing patients' needs, nurses' experiences and the research evidence

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## ABSTRACT

**Background/Aims:** Many patients undergoing life-preserving haemodialysis are exposed to additional risks because access is via a central venous catheter (CVC). Despite a paucity of evidence, guidelines and policies dictated the use of transparent exit site wound dressings, which was contrary to local nurses' practice of using an opaque wound dressing. This study aimed to explore nurses' experiences with three types of CVC exit site dressings in the context of a randomised controlled trial (RCT).

**Methods:** A descriptive exploratory design was used. Transcripts from seven focus groups held with haemodialysis nurses were analysed thematically.

**Results:** Fifteen nurses, with varying haemodialysis experience, provided comments on the ease of applying and removing the dressings, problems encountered with the dressings, which dressing types they thought best or worst, and the value of having a specific work practice instruction developed for the RCT. It was clear that, although no dressing type was perfect, the opaque dressing was the best given the properties of the dressings, the patients' preferences, and the humid climate.

**Conclusion:** The perspectives voiced by the focus group participants support the need to modify the local health service's policy, in line with revised state and national guidelines for this type of patient cohort, to allow for individual, contextual and climatic considerations.

**Keywords:** *Intravascular device dressings; evidence-based practice; focus groups; patient comfort; tropical weather; haemodialysis.*

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## INTRODUCTION

"Nurses are responsible for ensuring their decision-making is based on contemporary, relevant and well-founded knowledge and information"<sup>1(p.5)</sup>. However, sometimes practice may not reflect these authoritative sources, and knowledge is only one aspect of implementing evidence in practice<sup>2-4</sup>. The dilemma lies in whether nurses are aware of, have access to, and can determine the relevance of the contemporary evidence to a particular patient and setting at a particular time. As a clinical example, selection of central venous catheter (CVC) exit site dressings of haemodialysis patients living in the tropics may well be influenced by the experiences and expertise of nurses.

## BACKGROUND

In order to preserve renal function, some practitioners commence haemodialysis for end-stage kidney disease via a temporary CVC until a more permanent vascular access option is established. Patients may also require CVC access if their arteriovenous fistula or graft 'fails' until another permanent access is once again established.

Since haemodialysis is a life-sustaining therapy and CVCs bring additional risks of infection<sup>5</sup>, care of the catheter exit site is crucial. When CVCs are used for patients in other

situations, such as an acute intensive care episode through to long-term antibiotic administration, clean and intact catheter exit site dressings are usually left undisturbed for up to a week<sup>6</sup>. The usual practice in this haemodialysis unit was to remove and replace the CVC dressing at each dialysis episode, that is, two to three times per week, to enable the exit site to be assessed.

Dressings applied to CVC exit sites need to stay clean and intact. There is debate about the most appropriate dressing type to use on CVC exit sites, with the local state health department's guidelines at the time of this study recommending the application of a transparent dressing over the exit site to enable the continual observation of the wound<sup>7</sup>. Despite these guidelines, haemodialysis nurses used an opaque dressing on the CVC exit site wounds, believing that it was a more appropriate choice in the tropical climate because there was less moisture accumulation compared to transparent dressing types.

No literature could be found to support the health department's recommendation to preferentially use a transparent dressing<sup>7</sup>; similarly, no studies exploring the perspectives of the provider and/or patient regarding dressing selection, particularly in the tropics, could be found<sup>7</sup>. One study conducted in Brazil concluded that, informally, nurses and patients preferred a transparent dressing over gauze secured with tape. In that study, patients who had femoral CVC exit site wounds were excluded, and the authors stated that the transparent film dressing "was not feasible for patients with abundant sweating"<sup>8(p.485)</sup>.

A crossover randomised controlled trial (RCT) was established to examine the effectiveness of three dressings on CVC haemodialysis access sites and the study protocol included a set of instructions (not previously developed) about the application of dressings to the CVC site. Feedback was sought from nurses involved in the RCT. This paper discusses nurses' perspectives of different dressings used on CVC exit site wounds in patients receiving haemodialysis in a tropical setting in Australia in the context of the concurrent RCT.

## AIM

The aim of this study was to explore nurses' experiences of three different types of dressings used for CVC exit sites of patients undergoing haemodialysis in the context of a crossover RCT.

## METHODS

A crossover RCT of CVC exit site dressings for patients undergoing haemodialysis in tropical Australia was undertaken to compare a transparent dressing (as recommended by the state health department's infection control guidelines at that time) with a non-transparent 'opaque' dressing (as routinely used by the haemodialysis nurses). A combination-type dressing (Tegaderm IV<sup>TM</sup>, 3M), with a transparent window but opaque around the edges, was withdrawn early in the

RCT owing to several patients experiencing adverse skin reactions to it. The outcome measures in the RCT were dressing intactness and exit site infections; results have been disseminated to the clinicians. For the 26 patients who had both the transparent (IV3000<sup>TM</sup>, Smith and Nephew) and opaque (PRIMAPORE<sup>TM</sup>, Smith and Nephew) dressings, both dressings were likely to stay intact between haemodialysis sessions on average two-thirds of the times. There were four confirmed catheter-related infections when the patients had the transparent dressing applied to their CVC exit sites, but there were no confirmed infections associated with the use of the opaque dressing<sup>9</sup>. The RCT was undertaken in northern Queensland, Australia, over the months December 2010 to February 2011. This is the 'wet' season, when the mean daily maximum temperature is above 31°C, and the mean daily minimum temperature is above 24°C. February is the most humid month, with an average 9am humidity of 75%, and a 3pm humidity of 67%<sup>10</sup>.

To complement the quantitative data collected, focus groups were held with the nurses working in the three haemodialysis units included in the RCT to investigate their perspectives on the advantages and disadvantages of all three dressings initially used in the RCT, and to provide feedback about the trial's standardised dressing protocol. Ethics approval for the study was obtained from the Health Service's and the University's Human Research Ethics Committees (approval numbers HREC/09/QTHS/121 and HS3851, respectively); all aspects of the study complied with the requirements of the *National Statement on Ethical Conduct in Human Research*<sup>11</sup>.

Seven focus groups, held in February 2011, were led by nurse researchers not involved in the clinical care of the patients. The participant information sheet given to nurses working in the three haemodialysis units advised them about the purpose of the project, that they could choose whether to participate in a focus group, and that the focus groups would be recorded and later transcribed as part of the analysis process. In preparation for the sessions, a focus group guide was developed, which included four key questions:

1. How easy were the dressings to put on and take off?
2. What other problems did you have with the dressings?
3. Which of the dressings was best or worst? Why?
4. Was the work practice instruction clearly written and easily followed?

The nurses were also invited to provide general comments that did not fit neatly within the above questions, and to provide perspectives of their involvement in research in a busy clinical environment.

An inductive, descriptive, exploratory approach to thematic analysis was employed<sup>12,13</sup>. Focus group transcripts were initially analysed by one nurse researcher (WS), by reading, rereading and comparing responses provided to each of the key questions asked in the focus groups. Keywords

and phrases were highlighted; these 'codes' were then reduced to themes, by looking for similarities as well as for examples of opposing views in the data<sup>14(p.61),15</sup>. The other researchers reviewed the summaries, and queried comments and potential omissions; when necessary, the original recordings were compared to the transcripts for clarification. No individual nurse is identifiable in this paper.

## FINDINGS

Fifteen nurses participated in the focus groups; their haemodialysis nursing experience ranged from four months to more than 20 years, and several nurses had worked in other haemodialysis units, either in Australia or overseas. During the course of the focus group discussions, participants sought confirmation of their perspectives from their colleagues, as well as offering different points of view. Three themes arose from the analysis of the transcripts: nurses had to make the best of the available dressings; be considerate of the patients' perspectives; and work within the confines of the tropical climate. These themes are now discussed in turn.

### Theme 1: Nothing is perfect — making the best of the dressings available

The opaque dressing was clearly the easiest to apply, and generally the easiest to remove, according to many participants across all focus groups. For example, a participant in focus group 1 (FG1) stated *"I much prefer the [opaque dressing] because they are easier to stick on and easier to take off"*. Whilst the opaque dressing was deemed easy to apply and remove, there were inconsistencies as to the ease of using the transparent or combination dressings. One nurse noted that she had to pay more attention when using the transparent and combination dressings, and agreed with another nurse that the transparent dressing *"was more difficult"* (FG5). Several nurses explained that they often found that the transparent dressing stuck to itself, and it was difficult to apply in areas where they could not clearly access the skin area, such as when patients' clothing got in the way. Similarly, some nurses commented that they found the combination dressing a little tricky to learn how to apply and how to remove (for example, FG5). Consequently, nurses were unhappy if they 'wasted' a dressing and *"had to get another one"* (FG5). One experienced haemodialysis nurse was emphatic that the combination dressing was more difficult to apply than the transparent dressing, although it took no more than a minute longer (FG2b). This same nurse *"was disappointed that they [transparent and combination dressings] didn't work"*. Another experienced nurse commented that all dressings were easy to apply and remove, because of the additional information she had received about the combination dressings. This additional information was important to prevent her removing that dressing the wrong way (FG6). However, in another focus group a nurse with less haemodialysis experience commented that the combination dressing was difficult to apply, even though the company representative had demonstrated the technique (FG2).

There were several complete descriptions of the difficulties applying the transparent dressing. Nurses claimed that the transparent dressing needed a wide area to be able to spread it out, which was difficult if the patients' clothing was in the way (for example, if the patient did not wear button-through shirts) and it was awkward to apply (FG3). The transparent dressings *"tend to stick on themselves and then it gets messy and then they are yucky to take off as well"* (FG1). However, the nurses seemed to be able to manage with the opaque dressing even in the cases when they could not access a large area because of the type of clothing worn by the patient. The general consensus was that the opaque dressing was easy to remove, the transparent one the more difficult, and the combination was a little difficult if the correct process was not followed (FG3).

The focus group nurses voiced mixed perceptions about whether all dressing types stayed intact between dialysis sessions. One nurse said that the opaque dressings:

*"... are quite tattered by the time [the patients] arrive and they look really grubby and they are half off and the sides might have rolled up or something so it's hard to really assess it and I think the [transparent type] seem to keep a bit cleaner because they are waterproof so they don't get as grubby"* (FG1).

*"It's the way the dressing is made more than that it's not good"* (FG4).

One nurse clearly expressed that the combination dressing *"secured well"* and the extra piece of tape made it feel more secure (FG3). By comparison, the transparent dressing is only secured on two sides, and several nurses noted that these dressings tended to end up *"scrumpled and rolled up"* (FG4). One of the nurses in that group disagreed, and said that the transparent dressing was much better than the opaque dressing, which always got wet and the patient just removed it and puts the same one back on after showering (FG4). For those nurses who had used the combination dressing, they expressed that *"it stays on if you use it properly"*, even in the femoral area (FG4). However, another nurse in that same focus group said that *"it wouldn't matter if you were using Super Glue"*, no dressing would stay dry and intact over a femoral exit site. *"The femoral sites were just horrible; especially on larger people they're horrible."* (FG4). Thus, the comments revealed that the ability of the dressings to remain intact related to the nurses' expertise in applying them, the properties of the dressings, the weather, and the exit site location.

The nurses were asked to rank order the three dressings. Personal experiences certainly influenced some individual nurses' rankings, with one nurse saying that the combination dressing was the best because it never lifted off, she knew how to apply and remove it correctly and liked having the clear window through which to view the exit site (FG6). She conceded, though, that without the extra information

contained in the dressing protocol, *"it would have been quite easy to remove [it] the wrong way"*. In contrast, she ranked the transparent dressing the worst because *"it just wasn't sticking to our patient ... and her catheter site was actually quite exposed"* (FG6). Other nurses who had used the combination dressing early in the trial declared that it was the clear winner, and expressed their disappointment that it could not be continued because of the number and severity of skin reactions. Some nurses had no difficulties with all three of the dressing types and at least one nurse found that the combination dressing was easy to apply and said she would have rated that the best dressing type, if there had not been so many reactions to it. But since she also found the removal of the combination dressing was not as easy, that same nurse considered the opaque dressing best overall (FG3).

Having acknowledged that the combination dressing had not been successful, the opaque dressing was consistently nominated as overall best of the trialled dressings, despite its major shortcoming of being non-waterproof. Specific reasons provided for this top ranking included: its ease of application and removal (by both nurses and patients); less wastage; least expensive (even if multiple dressings were supplied); choice of several options for size and shape; and it was no less effective than the others when used in the difficult groin area. Other major reasons for nurses preferring the opaque dressing were that they had rarely encountered any reactions to it, and the patients told them they liked it. Also, some patients were able to reapply an opaque dressing in the case of getting them wet in the shower.

### Theme 2: Considering the patients' perspectives

The discussions about the properties of the dressing types indicated that the nurses were clearly influenced by the patients' perspectives as well as their own, as in the following:

*"The transparent and combination dressings stuck to hair (for example, chests) so removal was that much more uncomfortable, as reported to them by the patient"* (FG1).

No dressing type was thought to be best for femoral exit sites where there were folds of skin, usually a lot of hair and sweat. The nurses said that the patients reported the opaque dressing could be removed more gently because it had a smaller area adherent to the skin, in consideration of the patients' comfort (FG1). Nurses said that *"more of the [transparent type] felt itchy"* to the patients, which sometimes led to reddened areas (FG1). Another nurse claimed that patients requested the opaque dressing because it did not cause itchiness (FG2). Indeed, one nurse said that because there were no reactions or redness, the opaque dressing was *"the best for the patient"* (FG5), congruent with the comment from a nurse in another focus group that she thought the *"patients have less complications with it [the opaque dressing]"* (FG2).

Nurses in several focus groups explained that, in their routine practice external to this trial, they would give particular patients some spare opaque dressings to reapply after a shower. The ease of applying these dressings facilitated patients' involvement in their self-care (FG5), and the nurses acknowledged that it was often unreasonable in a hot, humid environment to advise patients with CVCs not to have showers. If the dressings had peeled off because of the humid weather or if they had become wet during showering, nurses were reassured that at least some patients could reapply an opaque dressing because *"they can't do as well with the [transparent dressing] because it's harder to manage"* (FG4). Thus, the continued use of the opaque dressing was viewed as more aligned with the patients' needs.

As described in the section about Theme 1, the opaque dressing was easier to apply even if the patients chose not to wear button-through shirts. Hence, the use of this dressing did not limit the choices of patients with respect to their clothing to the same extent that the other dressing types did.

### Theme 3: Working within the confines of the tropical climate.

Although not as clearly expressed as the other two themes, the influence of the hot, humid weather in this setting was related to the nurses' preferences with respect to the dressings. Without prompting, one nurse claimed that the opaque dressing was *"ideal"* for the local weather conditions (FG5). Another very experienced haemodialysis nurse commented that when working in a more temperate climate they had reverted back to the opaque dressing *"because [the transparent type] seemed to get moist underneath and the [opaque type] seems to stay on better on most people"* (FG7). Mention has been made above about the difficulties encountered in trying to get any of the dressing types to adhere to sweaty areas of skin folds, such as the groin.

The need for patients to shower in this climate presented problems in relation to CVC exit site dressings. Whilst transparent dressings generally repelled water from a shower the opaque dressing became wet and needed changing. Individual nurses described practices that they adopted for selected patients. These practices included the provision of additional replacement opaque dressings to patients they assessed as being competent to change them, or the provision of transparent dressings for the patients to apply over the opaque dressing while showering.

## DISCUSSION

The focus groups were an adjunct to the nurses' more structured participation in the main study. Those nurses who participated in the focus groups were very open and conveyed to the researchers that they welcomed this involvement. The focus groups were conducted at the end of the quantitative data collection period while the experience of the trial was fresh in the nurses' minds. The nurses often justified their responses about the dressing types from the

patients' perspectives, suggesting that their concern for the patients' experience was an important factor. The views expressed by the renal nurses in the focus groups supported the continued use of the opaque dressing in this tropical setting, in contravention of the organisation's own policy.

Since most patients attended haemodialysis as outpatients, they chose what clothes they wore. Clearly, those choices sometimes added to the difficulties encountered in applying dressings, particularly the transparent type. The variety of sizes and shapes of the opaque dressing type contributed to its ease of application and enabled respect of patients' choice of clothing options. Since the patients who underwent haemodialysis also needed to manage many other lifestyle modifications (including attendance at scheduled dialysis sessions several times weekly, fluid and dietary allowances), it was important to facilitate patients' control over their choice of clothing, particularly given the hot and humid weather of this setting. This was one way in which the care delivered by haemodialysis nurses demonstrated person-centredness, in line with the National Safety and Quality Health Service Standards<sup>16</sup>.

In this haemodialysis unit, all exit site dressings were routinely removed at every dialysis session (that is, every two to three days). The haemodialysis nurses reassess whether they should continue to routinely change intact transparent dressings (if used selectively for specific patients) at every dialysis session in the future, acknowledging the necessity of replacing dressings that have become loose, or become wet from showering, sweating or excess moisture accumulation. However, the practice guidelines for frequency of changing dressings acknowledges different levels of evidence for recommendations proposed by the many guidelines that haemodialysis nurses may consult<sup>17</sup>.

Also, given the state health department's guideline that CVC dressings should only be changed by trained staff<sup>18</sup>, the practice of providing patients with extra opaque dressings so that they can change them if they become damp or dislodged needs further consideration by the nurses. Whether transparent dressings could more safely be used for particular patients who may be able to better demonstrate an understanding of how to care for their exit site could be explored by the haemodialysis staff. The problems of dressings becoming wet during showering, or dressings becoming loose in the humid weather, remain to be addressed. At the very least, the content and delivery mode of patient education about care of their CVC exit site dressings needs to be reviewed for consistency.

The historical practice of these haemodialysis units in northern Australia has been to use the opaque dressing. Although nurses were initially eager to adopt the combination dressing, the number of skin reactions encountered by the patients contributed to their conclusions that the opaque dressing remains the most appropriate in this setting. The use of the opaque dressing is now consistent with Australia's

national recommendation that "patient preference, clinician preference and costs are currently acceptable factors when choosing between sterile gauze and transparent polyurethane dressings"<sup>19(p.143)</sup>. This recommendation reflects the insufficient evidence base for recommending that specific dressing types reduce the incidence of phlebitis or prevent infectious complications in short- or long-term use of CVCs<sup>19(p.143)</sup>. In fact, reasons provided by the nurses in these focus groups would seem to support a modification to local policy to allow the use of opaque dressings routinely on CVC exit sites of patients undergoing haemodialysis whilst recognising the need to tailor the selection of dressing to the individual patient and the climate.

## CONCLUSIONS AND IMPLICATIONS FOR PRACTICE

The nurses' viewpoints expressed in this study have provided a personal perspective to the objective findings from the RCT. Nurses were able to clearly articulate their reasons for continuing to use an alternative type of dressing to that recommended in general guidelines. It is difficult to dispute the value of these reasons, especially in light of the lack of any convincing evidence for the other types of dressings. The need for review of routine removal of transparent dressings, should they be selected for individual patients, has been identified. Similarly, the renal service is considering how best to provide education about the need to keep dressings dry and intact between dialysis sessions, and how it can balance involving patients in their own care and the risk of infections associated with an intravascular device. When the evidence is missing or equivocal, practice choices will be influenced by the context, patients' needs and clinicians' preferences, balanced against written policies and procedures.

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