

## Promoting Evidence-Based Nursing Practice: *Tap Water Cleansing of Leg Ulcers in the Community*

What is the evidence for the use of sterile saline or clean tap water for cleansing of leg ulcers in the community? Literature was sparse in refereed journals but this issue was covered in recent textbooks (Bale and Jones 1997; Dealey 1994; Flanagan and Marks-Maran 1997; Moffatt and Harper 1997). These texts promoted washing chronic leg ulcers in a bucket, bowl or shower using tap water. Evidence was based on data from clinical practice (Hollinworth and Kingston 1998). Hollinworth and Kingston (1998), in a hospital study, reported that an aseptic technique for wound management was used only for immuno-compromised clients, other wounds were cleaned with tap water, and they concluded there had not been a rise in infection rates. Indeed they revealed that correct hand washing technique was one of the singular most important factors in preventing infection. Young (1995) and Pudner (1997) concur, adding that there were numerous benefits in using tap water to cleanse chronic wounds in community practice. It was readily available and could also have psychological benefits in helping the client to feel clean. Dealey (1994) and Bale and Jones (1997) reported that a number of practitioners were using tap water to cleanse chronic leg ulcers and from clinical observation there were no adverse effects.

Contradicting the previous studies, Angeras et al (1992) compared the effects of tap water and sterile saline for cleansing. Angeras et al (1992) found that both tap water and saline are effective cleansing agents, but the incidence of sepsis was higher in the saline group. However, this study used warm tap water and cold saline. The drop in temperature that occurred when a cold solution was poured on a wound hindered the ability of macrophages to work effectively, and therefore may have impaired the wound's resistance to infection. This was perceived as a major methodological flaw of this study. Yet many authors refer to this research to support or dispute the use of tap water cleansing (Lawrence 1997; Hollinworth and Kingston 1998; Pudner 1997; Young 1995).

Despite lack of evidence and contradictory research findings, there are some indications that organisations are considering changing wound management policies. In the USA the Agency for Health Care Policy and Research (AHCPR) endorse the use of clean technique for management of pressure ulcers (Bergstrom, et al. 1994). However clean technique has not been defined by the agency nor is there strong evidence (using the evidence rating scale) to support this cleansing method. It is clear that wound management is gaining interest as Faller (1999) points out that the Emergency & Trauma Nursing Association selected clean wound care technique as top research priority. Identified is a need for further research in this area and to provide evidence for wound management practice and policy.

In 1998 Pam Selim, (Research Associate, RDNS Research Unit) working with nurses in a participatory action program, decided to examine cleansing practice of chronic leg ulcers in one of the RDNS regions. Initial data were gathered through the use of a short questionnaire that asked nurses to state if the client's leg ulcer was being managed using clean or aseptic technique. For this project aseptic technique meant that the nurse was utilising a sterile dressing pack and sterile cleansing solution (e.g. saline) as a component of wound management. Clean technique on the other hand meant that a sterile dressing pack and solution were not used. Dressing equipment was placed on a clean surface (not the sterile field of the dressing pack) and cleansing was usually either by

irrigating with saline, showering or washing the wound in warm water. If an aseptic technique had been used for the client's wound management then nurses were asked to provide a rationale for their choice. The response rate for the survey was 71% and 171 clients with a leg ulcer were surveyed. 75% of nurses used tap water and 25% used dressing packs.

### **Rationale for using an aseptic technique**

Nurses provided a variety of reasons for using an aseptic technique rather than the clean technique. There was concern about infection. Another reason cited was unclean home environment, where nurses claimed that they had difficulty locating a clean bucket and towel in some of the homes. In addition, clients appeared to have more confidence in the use of aseptic technique because they had observed this technique being used in the hospital. On a few occasions, nurses' use of water, bucket and towel was challenged by medical doctors. A General Practitioner had told a client that washing a leg ulcer in a bucket was inappropriate. Hospital staff in an outpatient clinic, directing the wound management of two clients, insisted that cleansing in a bucket was not acceptable. Another reason for nurses using an aseptic technique was cited as habit. Mindless transfer of wound management practice from the acute care sector to the community was the most common reason.

### **Further Research: Tap Water 2000 Project**

In a larger study conducted in 2000, the authors of this paper examined if any differences were evident when using warmed sterile saline compared to warm tap water for cleansing of chronic leg ulcers. Clients were randomly assigned a cleansing solution of either warmed tap water or warmed sterile saline. Clients that had sterile saline assigned as the cleansing solution would also have the nurse use an aseptic technique for wound management. This involved the use of a dressing pack. Clients who had been assigned tap water however, had their wound managed by nurses using a clean technique. The only difference in treatment between the two groups was the solution used for cleansing. The dressing choice and other treatments such as compression bandaging were provided as required. This was to ensure that the variables in treatment were consistent with usual community nursing practice. Whilst the assignment of tap water or sterile saline was random, both the client and the nurse knew which treatment they were receiving.

The main identifier for noting difference in treatment between the two groups was the presence of clinical infection. Chronic leg ulcers are known to be colonised with bacteria, therefore it is important to distinguish between colonisation and clinical infection. Signs of clinical infection include inflammation, pain, swelling, heat and purulent exudate. Delayed healing and wound breakdown are also considered signs of clinical infection, although it is difficult to determine for clients with chronic leg ulcers whether delayed healing is due to these factors (Cutting and Harding 1994). A study by Trengrove et al (1996) revealed that wound healing was not delayed by the presence of a specific group of bacteria but was delayed when four or more groups were involved. Conclusions drawn from this study showed that it was the number of organisms present rather than a specific type of bacteria that caused delayed healing. This study also noted that the bacterial flora of the wound bed changed as wound healing progressed, but that

these changes were not related to wound healing. Testing each client in the tap water 2000 project for the microbiological count of their wound, therefore, was unnecessary, time consuming and also costly. The results were to shed little light on the colonised/infected state of the ulcer. For these reasons nursing staff paid particular attention to clinical signs of infection rather than have clients' wounds tested microbiologically.

### Difficulties Encountered

There are many variables that need to be taken into account. Finding a homogenous group of clients with a leg ulcer was almost impossible due to age, gender, aetiology of ulcer and comorbidities that a client may have. However, our aim was to mimic wound management practice in the community as closely as possible.

Nevertheless, the tap water 2000 cleansing project encountered difficulties. Despite education, there was confusion from nurses about which clients should be considered for the project. The authors were aware that many clients were admitted to the organisation with a small laceration on the leg that often developed into ulcers. Therefore, all clients with a laceration on the lower leg were to be considered for this project. However, some nurses initially rejected these clients and then later requested a Doppler assessment as the wound worsened and began to appear as an ulcer. These clients were then not suitable for the tap water 2000 project and as a consequence, the total number of clients ended up as less than required. Some clients of Non English Speaking Background (NESB) were also not admitted to the project due to difficulty explaining the project, as no one was available to translate.

The project had a time frame of six months and this was clearly not long enough. Time for ethics approval, education of nurses and time from client admission to discharge became problematic. We allowed a time frame of three months from admission to discharge based on work by the Commonwealth Department of Veteran Affairs (1999) that showed most uncomplicated venous leg ulcers healed in 84 days. However only a small number of clients had been discharged since the tap water 2000 project began.

Inaccurate record keeping added to the project difficulties. Participants were selected at triage and an envelope containing the name of the cleansing solution to be used was distributed. Clinical Nurse Consultants were asked to record this these data. However, when the master sheet was collated with information from clients that had been discharged, some Unit Record (UR) numbers were missing and others did not match the name. Clients with the same names and without an UR number were also noted. In other instances, the client had been entered on the master sheet more than once and different solutions for cleansing had been used each time.

Some nurses also experienced difficulty with some of the wound documentation used for this project. The leg ulcer assessment tool is a standard part of the organization's documentation and therefore posed no problem. However, a wound assessment tool was developed specifically for use in this project and although nurses were educated in its use, its unfamiliarity created difficulty for some.

### Discussion

The tap water 2000 project did not generate any findings to support whether one cleansing solution was preferred for wound management of leg ulcers in the community. The

difficulties encountered precluded any meaningful data collection and analysis on this issue. The difficulties encountered with the tap water 2000 project highlighted the need for continued work on effective documentation of wound management practice. The involvement of nurses in researching their own practice through the 1998 participatory action groups assisted in understanding the need for an evidence-base to support practice. The 2000 tap water study showed that many things can go wrong whilst conducting research. Although this study did not contribute to evidence, we believe it was important to communicate the insights gained in the effort to conduct research, and learn from our 'mistakes'. Thus being better prepared we will be able to instigate further inquiry into tap water cleansing. Whilst there is evidence from the literature that a clean technique is appropriate for wound management practice of leg ulcers, particularly in the community, the tap water 2000 study was not able to add to the body of evidence. Nevertheless, in the absence of infection, we believe that the clean technique should be the advocated practice for management of leg ulcers in the community.

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