'Multi-use' versus 'Single patient': Lister scissors use in leg ulceration care

KEY WORDS

- Compression bandages
- Infection
- Leg ulcers
- Lister scissors
- Sterile equipment

Background: Leg ulcers have a 1% prevalence in the UK population, and they are usually treated with compression bandages. These need to be renewed at least once per week. Best practice is to cut the bandages using a Lister scissor. **Aims**: This study aimed to understand if non-sterile Lister scissors can be wiped with a disinfectant wipe in-between patients or require sterilisation. **Methods**: Lister scissors, used to remove patients' compression bandages were swabbed after having been cleaned with a sanitising wipe. Once cleaned, the scissors were placed on a clean, untouched, paper towel to dry. The scissors were then swabbed. We swabbed 16 scissors (n=16) after use on 16 different patients. **Findings**: Of the samples 43.7% had residual bacterial growth despite thorough cleaning. **Conclusion**: This small study highlights the difficulty to clean reusable non-sterile Lister scissors with disinfectant wipes. It is therefore recommended that sterile, single patient use Lister scissors are used to cut leg ulcer bandages.

FANIA PAGNAMENTA
Clinical Academic Nurse Consultant (Tissue Viability) ,DNursing, MSc, MA, BSc, RN. The Newcastle upon Tyne Hospitals NHS Foundation Trust/Northumbria University

ALLISON SYKES
Senior Nurse (Practice Development - Infection Prevention and Control) MSc, Churchill Fellow, BSc, RN. The Newcastle upon Tyne Hospitals NHS Foundation Trust

Leg ulcer care often involves using Lister bandage scissors (Lister scissors) to cut off compression or retention bandages. Lister scissors are used in leg ulcer care as they have an angled and blunt tip on the bottom blade and they are designed to safely lift bandages away from skin for easy cutting. The bottom blade of the scissor is longer and goes easily under the bandages. The blunt tip design of the scissor prevents accidental injury and makes bandage removal safer.

Generally, it is believed that any medical equipment that comes in contact with the wound itself, such as blades and forceps should be single-use or sterilised between clients. Equipment that does not come in contact with the wound such as bandage scissors should be simply disinfected between patients (Wietlisbach, 2014).

Clinicians would usually attempt to cut the bandage at a certain angle to prevent the scissors from being near the wound, as this may cause pain. At times, however, either the wound location is not known or the patient may have circumferential wounds. In these cases, the Lister scissor may inadvertently be in contact with the wound or a primary dressing that has become saturated with exudate.

In our Chronic Wound Healing Clinic, non-sterile Lister scissors were used to remove old bandages from patients living with chronic leg ulcers. These scissors were disinfected after each use with disinfectant wipes (Clinell sanitising wipes, Gama, Watford, UK). These wipes contain cationic biocides and are licensed for use on medical equipment surfaces.

Aim

Our study was designed to determine if non-sterile re-useable Lister scissors could be safely used to remove dressings from chronic wounds, such as leg ulcers. While all chronic wounds have a number of bacteria (Rahim et al, 2017) it is essential not to transfer microorganisms between patients.

Clinical context

In our large, tertiary organisation (Acute and Community care), registered nurses are trained to reapply compression bandages for a smoother transition from community to acute but also, compression bandages are initiated at 'front of house' (Assessment Unit) and on transfer to 'back of house', ward nurses are required to continue the treatment. As Lister scissors should be used to

remove compression bandages, and also all other types of bandages, we were met with a question as to whether to policise the use of sterile Lister scissors or clean Lister scissors.

Aim

This study was born from an idea that it was not possible to guarantee that scissors would be sufficiently clean before use when cleaned with universal wipes. The study took place during two leg ulcer clinics where many patients were seen and non-sterile Lister scissors were used. Practice at the time was that when not in use the non-sterile Lister scissors were stored in a tray in one of the drawers of the dressing trolley, which was cleansed at the end of each clinic with sanitising wipes.

METHODS

Lister scissors, used to remove patients' compression bandages and retention bandages were swabbed after having been cleaned with sanitising wipes. There were three or four scissors available for use and cleaned after use. While the clinic was running, after cleansing, the scissors were kept on top of a metal trolley, only used for this purpose, ready to be picked up and used for the next patient.

The Infection Prevention and Control Nurse (IPCN) observed the cleansing techniques of three staff involved in the running of the Chronic Wound Clinic. Once the scissors were thought to be thoroughly cleansed, they were placed on a clean, untouched, paper towel to dry. Once fully dried, the scissors were swabbed at the end of the procedure. Staff removed their dirty gloves, washed their hands and wore clean gloves to clean the scissors.

Data collection occurred over two weeks, during two clinics held in August 2017. In total, sixteen Lister scissors (n=16) were swabbed, which had been used on sixteen different patients.

Samples were taken using Amies charcoal swabs and inoculated on blood agar plates and incubated at 37°C in air. Following incubation the plates were examined for any growth at both 24 and 48 hours. Organisms were quantified in colony forming units (CFU) and full identification was provided using a matrix-assisted laser desorption ionization-time of flight mass spectrometry (MALDI-TOF MS),

RESULTS

Of the 16 samples seven had residual bacterial growth (***Table 1***), despite thorough cleaning. A number of different bacteria were identified *Staphylococcus epidermidis* was the most common (n=3) bacteria identfied, followed by *Staphylococcus warneri* (n=2), *Micrococcus luteus* (n=2), and *Kocuria rhizophila* (n=1).

DISCUSSION

A leg ulcer is a long-lasting (chronic) open wound that takes more than 4 to 6 weeks to heal. Leg ulcers usually develop on the lower leg, between the shin and the ankle. Studies suggest that 80% to 100% of leg ulcers may have bacteria (usually *Staphylococcus aureus* or *Pseudomonas aeruginosa*) present in the wound (National Institute for Health and Care Excellence, 2020), but this does not necessarily mean the wound is infected but rather colonised with these bacteria. Leg ulcers will heal despite the presence of bacteria (Harker, 2013).

Wounds such as leg ulcers provide a favourable medium for the growth of a wide variety of microorganisms, and this will be exacerbated if the host's immune response is compromised (MacLeod and Mansbridge, 2016). Wound contaminants are likely to originate from three main sources:

- The environment. Exogenous microorganisms in the air or those introduced by traumatic injury or from direct contamination from inanimate objects touching the wound, such as dressing scissors
- The surrounding skin, involving normal skin microflora such as *Staphylococcus epidermidis* or *Micrococcus luteus*
- Endogenous sources involving the gastrointestinal, oropharyngeal, and genitourinary mucosae (Duerden 1994).

Staphylococcus epidermidis, *Staphylococcus warneri* and *Micrococcus luteus* were isolated on the scissors and while these are common bacteria found in chronic venous leg ulcers, they can cause severe wound infections and possibly bacteraemia/sepsis. *Staphylococcus epidermidis* can cause boils, sinus infections, endocarditis and wound infections (Nguyen et al, 2017).

Staphylococcus warneri is a coagulase-negative staphylococcal bacterium. It is commonly found on human skin, present in approximately 50% of the healthy adult population, and has emerged as a

Table 1. Study results

Date	Specimen	Lab no.	Result
1	Dressing scissors	MG809708B	*Staphylococcus warneri,* 1 colony forming units (CFU) and *Micrococcus luteus,* 1 CFU
2	Dressing scissors	MG809709R	No growth
3	Dressing scissors	MG809710Y	*Staphylococcus warneri,* 1 CFU
4	Dressing scissors	MG809711W	*Kocuria rhizophila* ,1 CFU
5	Dressing scissors	MG809712A	*Micrococcus luteus,* 1 CFU
6	Dressing scissors	MG809713F	*Staphylococcus epidermidis,* 1 CFU
7	Dressing scissors	MG809714C	*Staphylococcus epidermidis,* 1 CFU
8	Dressing scissors	MG809715T	No growth
9	Dressing scissors	MG809716K	No growth
10	Dressing scissors	MG835464M	No growth
11	Dressing scissors	MG835465J	No growth
12	Dressing scissors	MG835466V	No growth
13	Dressing scissors	MG835467B	*Staphylococcus epidermidis,* 2 CFU
14	Dressing scissors	MG835468R	No growth
15	Dressing scissors	MG835469X	No growth
16	Dressing scissors	MG835470W	No growth

cause of serious wound infections in the past two decades (Bhardwaj et al 2016). *Micrococcus luteus* is associated with septic arthritis, prosthetic valve endocarditis, and recurrent bacteraemia.

Kocuria rhizophila was isolated in one of the samples, this bacterium is not commonly found in leg ulceration. Recently, however there has been a rise in the incidence of infections caused by *Kocuria* spp. causing both superficial infections and deep-seated/invasive infections (Kandi et al, 2016).

Interestingly, while *Staphylococcus aureus* is the most prevalent potential pathogen in leg ulcers (Hansson 1995; Bowler and Davies 1999), it was not isolated in our sample.

Most chronic wound infections involve mixed populations of both aerobic and anaerobic microorganisms. Interestingly, the results show only aerobic microorganism, it is surprising, for instance that *Pseudomonas aeruginosa* was not isolated as often leg ulcers in clinical practice have a green discharge commonly associated with this bacterium (Raizman et al, 2021). This could be due to the wipes were effective in eliminating anaerobic microorganism or could also be due to these organisms being more difficult to culture (Bowler et al, 2001). In fact, compared with aerobic microorganisms, the culture, isolation, and identification of anaerobic bacteria is more time-consuming, labour-intensive, and expensive (Bowler et al, 2001).

Anaerobes are believed to die rapidly in air, the method of specimen collection and transportation to the laboratory can be critical for maintaining viability and for effective culture as well as communicating to the laboratory key information so that these bacteria can be grown if present.

While most of the sample grew a bacteria that is commonly found on skin, one sample grew bacteria that is not commonly found on skin but it typically found in soil and cross-contamination between patients might have had significant clinical significance. The universal wipes are not a replacement for sterilisation and in this clinical situation they should not be relied upon to clean Lister scissor for reuse without sterilisation.

It is acknowledged that some clinicians may

clean their non-sterile Lister scissors before each patient contact and before cutting the bandages and this may minimise the risk of cross contamination. Yet, it is indisputable that cleaning scissors effectively remains challenging, in our study, 43.8% remained contaminated. These findings mirror those reported by Murray (2000) in a study where 232 pairs of scissors from a range of health care professionals were swabbed. It was reported that organisms were isolated from 182 scissors, and most of these were from nurses' scissors.

Limitations

As highlighted above, anaerobes were not isolated and this may be due to the difficulties in isolating the bacteria. While the differing techniques for cleansing non-sterile scissors might have produced these positive results, they mirror 'real life' clinical practice in a busy wound healing clinic. Additionally, the paper towels used were not swabbed before the scissors being laid on, whilst these are not sterile, the surface where the scissors were laid was not touched and therefore it is unlikely that they would carry skin bacteria before use, however this was not verified in this study.

The patients' wounds were not swabbed to ascertain if the bacteria grown in the wounds matched those found on the scissors; this would have been difficult as most of the bacteria found on the scissors are commonly found in colonised or infected leg ulceration and therefore could have originated from any number of previous patients. However some of the bacteria found was unusual, such as *Kocuria rhizophila*, whose virulence in wound care is emerging (Kandi et al, 2016). This could have probably been traced to a single patient and therefore have relevance in cross-contamination.

Furthermore, staff undertaking the cleaning were under direct surveillance from a senior infection prevention and control nurse and therefore cleaned the scissors most thoroughly, this might have resulted in less bacterial growth in our sample than in normal circumstances (ie not under study conditions).

Finally, it is acknowledged that this study has a very small sample and further research should be undertaken to confirm or dispute these findings. Nonetheless, the authors believe that these findings are sufficiently significant to warrant a change in practice.

Translating the findings for clinical practice

In light of the above findings, it was decided that sterile Lister scissors should be used in our organisation when removing bandages used in leg ulcer care and we opted for single use disposable Lister scissors.

CONCLUSION

This study highlighted that it is difficult to clean reusable non-sterile Lister scissors with disinfectant wipes and these should not replace sterilisation. Lister scissors used to cut bandages in leg ulcer care can come in contact with the wound bed and cross-contamination can occur. It is therefore recommended that sterile Lister scissors are used for this procedure. WUK

ACKNOWLEDGMENTS:
The authors wish to thank SN Linda Mason and SN Rebecca Currie for their assistance in data collecting and to Caroline Cullerton, Healthcare Scientist for Infection Prevention and Control for undertaking the laboratory tests.

DECLARATION OF INTEREST:
The authors have no affiliation with any organisation with a direct or indirect financial interest in the subject matter discussed here.

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