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# Venous leg ulcer management in general practice

## Practice nurses and evidence based guidelines

### Background

Venous leg ulcers represent the most common chronic wound problem seen in general practice and are commonly managed by practice nurses. Compression therapy has been shown to improve healing.

### Methods

We explored current practice nurse management of venous leg ulcers to determine if evidence based guidelines were used to aid management. A cross-sectional survey in a metropolitan general practice network was used.

### Results

The majority of practice nurses reported that they do not routinely use, or have confidence in using, a Doppler to measure ankle brachial pressure index before compression application and are not responsible for application of compression therapy. Most common referrals are to wound clinics or vascular surgeons. Barriers to referral include access to services and cost of compression bandages.

### Conclusion

Our study highlights that practice nurse knowledge of venous leg ulcer management is suboptimal and that current practice does not comply with evidence based management guidelines.

### Keywords

venous ulcer; nurses practice patterns; general practice; health knowledge, attitudes, practice

Chronic venous insufficiency (CVI) affects 2% of the Western population.<sup>1</sup> One in 5 patients with CVI suffer venous leg ulceration and often have recurrent episodes.<sup>2</sup> This results in significant morbidity to individuals and cost to the health system.<sup>3</sup> Venous leg ulcers (VLUs) represent the most common chronic wound problem seen in general practice and are commonly managed by practice nurses (PNs).<sup>3</sup> Standard best practice treatment of VLUs includes multicomponent compression bandaging of the lower leg<sup>4</sup> to reduce hydrostatic pressure in the limb.

Practice nurses work in approximately 60% of Australian general practices.<sup>5</sup> One of their main roles is to manage patient wounds.<sup>6</sup>

Although several venous ulcer clinical guidelines have been developed internationally,<sup>7-9</sup> at the time of this survey there were no Australian venous ulcer clinical guidelines available. (The Australia New Zealand *Clinical practice guideline for prevention and management of venous leg ulcers* was in development.<sup>10</sup>) The Scottish Intercollegiate Guidelines Network [SIGN]<sup>11</sup> *National clinical guidelines for management of chronic venous leg ulcers* was selected for the basis of the survey tool as the appraisal tools used by SIGN informed the Australia New Zealand guideline<sup>12</sup> and reflected practice over which PNs had a high level of control. Key SIGN recommendations are outlined in *Table 1*. The indications for referral as outlined in the Australia New Zealand guideline are listed in *Table 2*.

This study surveyed PNs to determine whether current practice is in line with principles agreed in VLU best practice guidelines.

### Methods

A cross sectional survey of PNs was undertaken

in a major general practice network in Melbourne (Victoria), comprising 325 registered general practices. The network includes 151 PNs in 142 practices. Surveys were distributed between May and July 2010 by the network using its own postal database. An explanatory letter detailing the project purpose and a reply paid envelope was included to encourage survey return. Participation was voluntary. To promote participation we offered free registration to a wound seminar conducted by Monash University.

### Survey tool validation

A focus group in November 2008 of five nurses, each with more than 10 years experience caring for patients with chronic wounds in general practice, informed development of the survey tool. Focus group discussion was audiotaped and thematically classified using an iterative approach.<sup>13</sup> The draft survey tool was piloted on five independent PNs with experience in wound management to determine face and content validity. The final survey tool consisted of 28 questions (open ended [n=11] and closed [n=17]) to determine VLU management in general practice; knowledge of and adherence to best practice guidelines; barriers, facilitators and experiences regarding referral to specialist wound clinics; and views on potential improvements to venous ulcer care for patients.

### Data analysis

Descriptive statistics were used to describe VLU management and knowledge/adherence to best practice guidelines. Fisher's exact tests were performed to evaluate binomial data. Emerging themes from open-ended survey questions were categorised. For free text responses, thematic categories were developed and comments were independently coded by two researchers.

Ethics approval was obtained from the Monash University Human Research Ethics Committee.

**Table 1. SIGN key recommendations for venous ulcer management<sup>11</sup>**

- High compression multicomponent bandaging should be routinely applied
- Measurement of ABPI should be performed by appropriately trained practitioners who maintain their skills
- Compression therapy can be safely used in leg ulcer patients with an ABPI  $\geq 0.8$
- Patients with an ABPI  $< 0.8$ , and in patients with diabetes, compression should only be used under specialist advice and with close monitoring
- Specialist leg ulcer clinics are recommended as the optimal service for community treatment of venous leg ulcers
- Below-knee graduated compression hosiery is recommended to prevent recurrence of venous leg ulcer in patients where healing has been achieved

**Table 2. Referral indications from Australia New Zealand Clinical practice guideline for prevention and management of venous leg ulcers<sup>12</sup>**

- Diagnostic uncertainty
- Atypical ulcer characteristics at location
- Suspicion of malignancy
- Treatment of underlying conditions including diabetes, rheumatoid arthritis, vasculitis
- Peripheral arterial disease indicated by an ABPI  $< 0.8$
- ABPI  $> 1.2$
- Contact dermatitis
- Ulcers that have not healed within 3 months
- Recurring ulceration
- Healed ulcers with a view to venous surgery
- Antibiotic resistant infected ulcers
- Ulcers causing uncontrolled pain

### Task responsibilities

When asked to report PN task responsibility for people with VLU, a total of 47/54 PNs (87%) reported use of some type of compression to treat VLUs, with 23 (49%) reporting use of compression stockings, 14 (30%) using a single layer bandage and 10 (21%) using multilayer bandaging. Only 37% of PNs (20/54) reported confidence in the application of compression bandaging. Wound management courses did not impact on whether compression was applied ( $p=0.55$ ) or confidence in application ( $p=0.54$ ). Even though no PNs reported being responsible for undertaking ABPI measurement, in a subsequent question when PNs were asked if they used a Doppler to assess ABPI, 7/54 (13%) reported routinely using a Doppler ultrasound to measure ABPI before compression bandaging and 12.5% reported confidence in use of Doppler. Attendance at a wound management course did not impact on use of a Doppler ultrasound ( $p=0.66$ ) or confidence with its use ( $p=0.16$ ).

### Adherence to guidelines

A total of 39/54 (72%) of PNs reported that no VLU management guidelines were used. Eight

## Results

The response rate was 54/151 (36%).

Respondents were predominantly qualified as Division 1 registered nurses (83%), aged over 40 years, and female (Table 3). The study demographic profile findings of our study correspond to the demographic profile of PNs working in Australian practice settings.<sup>14</sup>

### Venous leg ulcer management

Table 4 provides a summary of VLU management responsibilities, as determined by PNs.

### Treatment responsibility

Most PNs (64%) reported that a collaborative treatment approach was taken with the general practitioner to determine the patient's VLU treatment and stated they were responsible for managing the patients once the treatment plan was determined, only 31/54 (57%) reported being responsible for compression bandage application. No PNs reported being responsible for measuring ankle brachial pressure index (ABPI). Many PNs, 41/54 (76%) reported sole responsibility was for dressing application.

**Table 3. Baseline survey demographics [n=54 (%)]**

<b>Age (years)</b>	20–29	1 (2)
	30–39	5 (10)
	40–49	21 (39)
	50–59	23 (43)
	60+	4 (6)
<b>Gender</b>	Female	47 (87)
	Not stated	7 (13)
<b>Qualifications</b>	Division 1	45 (83)
	Division 2	9 (17)
<b>Years in general practice</b>	<2 years	24 (44)
	3–10 years	12 (22)
	>10 years	10 (19)
	Not stated	8 (15)
<b>Wound education course</b>	Yes	28 (52)
Course length	1 day	15 (28)
	>1 day to <1 week	11 (20)
	>1 week	2 (4)
<b>Number of GPs in each practice</b>	1–3	5 (9)
	4–5	11 (20)
	6–9	16 (30)
	10–16	13 (24)
	17–24	8 (15)
	Not stated	1 (2)

PNs (15%) reported use of guidelines or written protocols.

## Management and referral

Table 5 summarises PN management and referral practices. Almost 90% of PNs reported that they managed patients for 3 months or less before specialist referral. Patients were principally referred to either a vascular surgeon (36/54 or 67%) or specialist wound clinic (32/54 or 59%) if wounds failed to heal.

## Referral to specialist wound clinics

Table 6 summarises PN responses to experience with referral to wound specialist clinics and suggestions to improve the service. Practice nurses who indicated referral to specialist wound clinics (n=32) were asked give main reason/s for referral. Three principal themes emerged: these related to nurse, wound and patient factors. All respondents (n=54) were asked to comment on barriers to specialty wound clinic referral and ways this could be improved. Barriers included the GP being reluctant to refer, wound clinic factors such as geographical location, and patient factors such as inability to afford the service. Suggestions to improve referral process included the need to better coordinate care and improve access to specialist information and resources.

## Improving venous leg ulcer care

Practice nurses were asked, 'What, in your opinion, would improve venous ulcer care and adherence to compression for patients?' We identified four dominant themes: cost reductions, improved compression techniques, improved access to treatment and routine use of VLU guidelines (Table 7).

## Discussion

This survey of PNs working in general practice clinics identified that knowledge of VLU management is suboptimal and current practice does not comply with evidence based management guidelines. Practice nurses do not routinely undertake differential diagnostic assessment to rule out arterial involvement and appear to overservice patients with VLUs. Despite recognition by PNs that specialist wound clinics provide a valuable resource and relieve pressure on general

practice clinics, 40% do not refer patients for treatment. The majority of PNs (89%) reported referral of VLU patients within the recommended timeframe suggested by the Australia New Zealand *Clinical practice guideline for prevention and management of venous leg ulcers*.

Our finding that PNs worked in collaboration with GPs to determine the treatment plans is in contrast to a study which surveyed United States family physicians<sup>15</sup> and found that treatment and management of VLU patients is undertaken primarily by the physician, although this may

**Table 4. Responsibility and tasks performed by the practice nurse in regard to VLU management, n=54 (%) unless otherwise stated**

<b>Practice nurse treatment responsibilities</b>	
Diagnosis of VLU	11 (20)
<b>Development of the treatment plan</b>	
<b>n=53 (%)</b>	
PN has sole responsibility	3 (6)
PN and GP joint responsibility	34 (64)
GP has sole responsibility	12 (23)
Other health professional responsible	4 (8)
<b>Practice nurse tasks</b>	
Compression bandaging	31 (57)
Ankle brachial pressure index measurement	0
Wound dressing only	41 (76)
Patient education	37 (69)
<b>Adherence to evidence based guidelines</b>	
Use best practice guidelines to inform management of patient with venous ulcer (n=47)	8 (15)
Routinely measure ABPI to exclude arterial disease before compression bandaging	7 (13)
Feel confident to use Doppler to assess ABPI (n=48)	6 (12.5)
Routinely use compression bandaging to manage patients with venous leg ulcers	47 (87)
Feel confident to apply compression bandage	20 (37)

**Table 5. Management and referral practices**

<b>Frequency of patient visits to GP clinic for active treatment</b>	
<b>n=50 (%)</b>	
Daily	1 (2)
≥3 times per week	7 (14)
Twice weekly	35 (70)
Weekly	1 (2)
Wound dependent	6 (12)
<b>Time treated before on-referral to specialist</b>	
<b>n=47 (%)</b>	
≤3 months	42 (89)
>3–6 months	5 (11)
<b>Specialist referral pattern (respondents could tick as many as relevant)</b>	
<b>n=54 (%)</b>	
Specialist wound clinic	32 (59)
Vascular surgeon	36 (67)
Dermatologist	7 (13)
Plastic surgeon	11 (20)
General surgeon	1 (2)
Doppler	1 (2)

be due to a different health service provision and nurse payment structure. A United Kingdom survey reported that 71% of PNs reported being solely responsible for determining the patient's VLU treatment plan<sup>16</sup> and an Australian study of GPs in 2006 reported that nursing assistance for leg ulceration management was an integral part of general practice.<sup>3</sup>

Despite 70% of PNs in our study reporting they have some responsibility for determining VLU management, it was of some concern that less than 20% stated that they used best practice guidelines to direct treatment. When asked to

report frequency of general practice attendance for dressing and bandage changes, in general more than 80% of patients were seen at least twice a week. Although situations such as wound infection may require frequent visits for treatment, previous research has demonstrated that uncomplicated VLU patients can be managed with weekly dressing and adequate compression treatment.<sup>17</sup>

The finding that the vast majority of PNs do not routinely use, or have confidence in using, a Doppler ultrasound device to measure ABPI has been found by others. Studies have identified

deficiencies in general practice management of leg ulceration, specifically the underuse of ABPI measurements, over-reliance on dressings and lack of understanding of compression therapy.<sup>3,15,18</sup> It is possible that Doppler assessment was not available in the clinics surveyed or that patients were sent elsewhere for ABPI measurement. Other issues may be the amount of time available to perform ABPI measurement, whether the PN has been trained in ABPI measurement and whether the practice is remunerated for ABPI measurement. These factors will need to be further explored if, as outlined in best practice guidelines, compression should be routinely applied after ABPI is assessed to exclude arterial disease, then it would follow that ABPI should be measured by trained practitioners before compression application, but we have not found this to be common practice in our survey.

Compression bandaging, the first line treatment for venous ulcers, has been shown to be the most effective noninvasive treatment to heal ulcers.<sup>4,19,20</sup> The finding that 57% of PNs reported they were not responsible for application of compression therapy and that half use compression stockings is concerning, particularly if stockings are used instead of bandages to treat the ulcers. While below-knee graduated compression stockings are recommended to prevent VLU recurrence once healing has been achieved,<sup>16</sup> best practice guidelines state compression bandages are used when an ulcer is active. The lack of confidence among PNs regarding VLU management is consistent with other literature showing that community nurses are often uncertain of which type of compression bandage to use and its correct application.<sup>21–23</sup>

Venous leg ulcer care is best provided using a multidisciplinary approach, evidence based guidelines and patient involvement.<sup>24</sup> There is good evidence to demonstrate that patients treated at specialist wound clinics have quicker and more complete wound recovery compared to traditional treatment in general practice clinics.<sup>25</sup> However, to the best of our knowledge, no previous studies have investigated referral patterns, barriers and facilitators to improving specialist wound clinic care. Our explorative qualitative analysis has identified important issues that warrant further investigation.

Reluctance by GPs to refer patients to

**Table 6. Reasons for patient referral to wound clinics, barriers and facilitators of service provision**

<b>Reasons for referring a patient to a specialty wound clinic</b>	
Nurse factors	<ul style="list-style-type: none"> <li>• Lack of time to undertake dressings or bandage</li> <li>• Lack of protocol to effectively manage patient with existing resources</li> <li>• Lack of confidence in managing/bandaging patient</li> </ul>
Wound factors	<ul style="list-style-type: none"> <li>• Need for expert assessment,</li> <li>• Wound is complex, not healing or deteriorating</li> </ul>
Patient factors	<ul style="list-style-type: none"> <li>• Patients have complex medical needs and/or multiply comorbidities</li> </ul>
<b>Barriers to referral by practice nurses to specialty wound clinics</b>	
General practice factors	<ul style="list-style-type: none"> <li>• Reluctance of on referral of patients</li> </ul>
Wound clinic factors	<ul style="list-style-type: none"> <li>• Long waiting times for patients to be seen in the clinic</li> <li>• Lack of wound clinics in the geographical area</li> <li>• Incapacity of general practice clinics to provide dressings and bandages recommended by the specialty wound clinics</li> </ul>
Patient factors	<ul style="list-style-type: none"> <li>• Language difficulties and poor health literacy</li> <li>• Long travel distances to wound clinics</li> <li>• Inability to afford the costs of treatment (no bulk-billing)</li> <li>• Reluctance to leave the trusted relationship with the GP and the general practice clinic</li> </ul>
<b>Facilitators of improving the referral process to specialty wound clinics and service provision by specialty wound clinics</b>	
Improve access	<ul style="list-style-type: none"> <li>• More clinics</li> <li>• Enable nurses to initiate referral and provide nurse initiated referral pads</li> </ul>
Improve information	<ul style="list-style-type: none"> <li>• Provide information on costs for patients to use the service</li> <li>• Provide information on locations of speciality wound clinics</li> <li>• Provide comprehensive information about the service offered</li> <li>• Provide documented care plans to general practice clinics</li> </ul>
Improved access to resources	<ul style="list-style-type: none"> <li>• Foster a productive reciprocal relationship between PNs and wound clinic nurses (eg. PNs to attend wound clinics to observe wound practice and wound clinic nurses attend general practice clinics to educate PNs about care pathways)</li> <li>• Provision of ad hoc expert advice to PNs via telephone</li> </ul>

**Table 7. Summary of recommendations made by practice nurses to improve patient care and adherence to compression bandaging**

Identified theme	Comments made supporting the identified theme	Recommendation
Reduce cost of compression bandages	'Cost of stockings prohibitive for some patients'	'Funding of dressing and bandage' 'Lower cost of compression stockings and socks'
Improved application technique to enhance comfort	'I realise compression is cornerstone of treatment for venous ulcers but not many will tolerate much compression' 'Most patients with venous leg ulcers are elderly and find it too hard to put stockings on and put [them on incorrectly (sic, which)] can cause more damage' 'Some patients have spent a small fortune on compression stockings only to find them too hard to get on'	'Simpler bandaging' 'Bandages that patients will be willing to keep on and can afford'
Improved access to treatment including home visits and improved access to ABPI	'Increasing access to ABPI for patients' 'Elderly find it difficult to attend the clinic regularly due to transport problems and are unable to bandage legs by self' 'Proper treatment based on guidelines'	'Improve access to ABPI for patients' 'Training for PNs'
Improved access to information by PNs and GPs	'Improved education for PNs and GPs regarding wound management' 'Improved knowledge of assessment and diagnosis' 'Confidence in recommending treatment'	'Need simple guidelines for GPs for leg ulcer management'

specialist care may reflect inadequate knowledge of current best practice guidelines or available services. Specialist wound clinics will likely benefit from greater interaction with both GPs and PNs to improve integrated care pathways. Because lengthier durations and larger ulcers take longer to heal,<sup>26</sup> rapid, coordinated referral for people with VLUs would provide the greatest potential for reducing both human and financial burden.

This study confirmed that most general practice clinics treat at least 2–3 VLU patients per week, which is similar to US findings,<sup>15</sup> and demonstrates

there is an opportunity for primary care to positively impact on quality of life and healing outcomes for VLU patients and also to reduce the financial burden of this disease. Health system changes, coupled with the Australia New Zealand *Clinical practice guideline for prevention and management of venous leg ulcers* may be an opportunity to improve coordination of VLU services. The aging Australian population means that management of VLUs will continue to cause considerable strain on the health system in the future. Therefore, implementation of integrated multidisciplinary care pathways that include implementation of VLU

guidelines, an audit of VLU management strategies in primary care would be useful.

### Study limitations

There are a number of limitations to our study. The survey response was limited to 54 PNs working in metropolitan general practices, so findings should be generalised beyond this group with caution. It is also possible that Division 2 nurse respondents may not have had the expertise to carry out all aspects of VLU management. The response rate of 36% may have resulted in response bias where only the most interested and knowledgeable nurses completed the survey or alternatively that respondents may have been enticed to participate due to the opportunity to attend a wound education event. To determine views on barriers and facilitators to referral we considered a qualitative study design to be the most effective means of collecting data, but recognise that in using this approach we are unable to identify the strength of opinion for each identified issue. This will require further investigation using a quantitative approach. Finally, the survey asked PNs to recall past experiences in managing patients with venous ulcers and these may be affected by recall bias. Despite these limitations our study highlights the need to improve primary care management of people with VLUs.

### Implications for general practice

Our study suggests that:

- Improved management and referral pathways for people with VLU are needed
- Further investigation to determine the most appropriate coordinated VLU model of care is required
- Investigation of health professional uptake of the Australia New Zealand guidelines is required
- Further investigation and greater investment in upskilling PNs in ABPI measurement is required
- Compression application may improve VLU management in primary care settings.

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