
Venous Leg Ulcer Management: The Royal Brisbane Hospital Leg Ulcer Clinic Experience

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Introduction

The Royal Brisbane Hospital (RBH) ulcer clinic, a multidisciplinary outpatient clinic, commenced operation at least 30 years ago, when it was known as the Venous Clinic. Its aim is to provide a fully integrated ulcer healing service for those with leg ulcers in our district. Several studies¹⁻⁶ have shown that a well-organised, multidisciplinary outpatient clinic service specialising in the healing of chronic ulcers can improve ulcer healing rates at a reduced overall cost to the health-care system. Healing rates of between 50 and 86 per cent have been achieved with conservative therapy alone. The problems faced by community nurses and general practitioners (GPs), who are traditionally responsible for long-term ulcer management, are also well documented, with many largely ineffective treatments the product of uncoordinated assessment and lack of an evidence-based protocol^{3, 7, 8}.

A tertiary care referral centre, the RBH serves an immediate population of 750,000 in the northern region of Brisbane, Australia. Its ulcer clinic is staffed by a team of experienced clinical nurses and relies on ongoing input from consultant surgeons. The clinic operates 5 days a week, in conjunction with the surgical outpatients department. There is a close re-relationship between the ulcer clinic and the vascular surgical department, with the latter readily providing vascular imaging and consultative services. The clinic also has available to it a team of physiotherapists, occupational therapists and plaster

technicians, plus an orthotics and prosthetics service. Community nursing services are utilised when frequent visits to the clinic are unnecessary or undesirable, and for long-term management once healing has been achieved.

How the Clinic Works

Referrals

In 1998, 112 new patients were treated, compared to 1997, in which there were 47 new patients. The number of occasions on which service was provided was 4717 in 1998 and 2556 in 1997. Most referrals (99 per cent) come from GPs, with the remainder from consultant specialists of the RBH. Patients can be referred from rural centres as far away as 240 kilometres.

Initial assessment

Each new patient undergoes a complete medical assessment, including full medical history and examination. Specific features elicited from this history include the following.

- Ulcer duration.
- Local symptoms (pain, parasthesia/anaesthesia, swelling).
- History of trauma.
- Previous leg/abdominal surgery.
- Previous deep vein thrombosis (DVT).
- Other medical conditions (especially diabetes, rheumatoid arthritis, hypertension, cardiovascular disease, varicose veins).

A local and general examination is performed on each new referral, including ankle-brachial index. Patients are encouraged to attend their GP for such screening examinations as are considered appropriate. Any clinical signs of infection (fever, lymphadenopathy, erythema) are noted. Nursing staff complete the wound management referral form (Figure 1) and medical staff are reminded to perform the investigations suggested by the wound checklist (Figure 2), which has proved an excellent prompt.

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Figure 1. The wound management referral form in use at the RBH leg ulcer clinic.

Royal Brisbane Hospital and District Health Service

WOUND MANAGEMENT RECORD FORM Date Wound First Seen: _____

Answer all questions when the wound is first seen. Subsequently, record any significant progress/deterioration in appearance. Trace the wound once a week, remembering to indicate undermined skin areas.

Wound type	Abbrev.	Stage of depth	Abbrev.	Surrounding Skin	Abbrev.	Goal
Abrasion/skin tear	A	Stage I	I	Macerated	O	Debridement
Red/granulating wound	B	Skin is unbroken, redness doesn't		Oedematous	P	Rehydration
Pink/epithelialising wound	C	fade when pressure is relieved,		Erythema	Q	Promote granulation
Green/infected wound	D	no exudate		Eczema	R	Protection
Yellow/sloughy wound	E	Stage II		Fragile/friable	S	
Black/necrotic wound	F	Superficial skin loss only, with	II	Dry/scaly	T	
Malignant/malodorous wound	G	distinct edges blending into an		Healthy/intact	U	
Suture line	H	indistinct area of redness, heat				
		and swelling – area may be painful				
ODOUR	None	Stage III	III	Pain	Exudate	
	Some	Break in the epidermis involving		Scale 1-10	High	J
	Offensive	the dermis and subcutaneous tissue		No discomfort	Moderate	K
	Stage IV	IV		Low	L	
		Dermis into cavity – may involve		Intermittent	Amount >	M
		muscle and bone		Continuous	<	N
		Pus present? <input type="checkbox"/> Yes <input type="checkbox"/> No Swab sent? <input type="checkbox"/> Yes <input type="checkbox"/> No Biopsy? <input type="checkbox"/> Yes <input type="checkbox"/> No Sutures removed? <input type="checkbox"/> Yes <input type="checkbox"/> No				

Date	Wound type	Odour	Stage of depth	Surrounding skin	Pain and intervention	Exudate	Swab sent	Dressing type/management goals/comments/signature

Predisposing factors

<p>Physiological</p> <input type="checkbox"/> History of deep vein thrombophlebitis <input type="checkbox"/> Peripheral vascular disease (arterial) <input type="checkbox"/> Varicose veins <input type="checkbox"/> Ankle/leg oedema <input type="checkbox"/> Lymphoedema <input type="checkbox"/> Diabetes mellitus <input type="checkbox"/> Cardiovascular disease <input type="checkbox"/> Anaemia <input type="checkbox"/> Rheumatoid arthritis <input type="checkbox"/> Medications (corticosteroids) <input type="checkbox"/> Venous incompetency <p>Record allergies _____</p>	<p>External</p> <input type="checkbox"/> Trauma <input type="checkbox"/> Vascular surgery <input type="checkbox"/> Infection <input type="checkbox"/> Spontaneous <p>Who does the client live with?</p> <input type="checkbox"/> Alone <input type="checkbox"/> With carer (spouse or family) <input type="checkbox"/> Other (hostel, please specify) _____	<p>Client lifestyle</p> <input type="checkbox"/> Smoker number/day <input type="checkbox"/> Previous smoker <input type="checkbox"/> Obesity <input type="checkbox"/> Malnutrition <input type="checkbox"/> Poor nutrition <input type="checkbox"/> Immobility (eg. arthritis, surgery) <p>Was the wound photographed? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Doppler reading (if performed) _____ mm/Hg</p>
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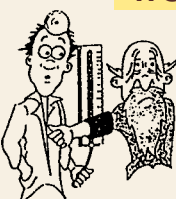
DATE							
Max. length cm							
Max. width cm							
Depth cm/mm							
Are dimensions:							
• increasing?							
• decreasing?							
• static?							

We undertake to do the following.

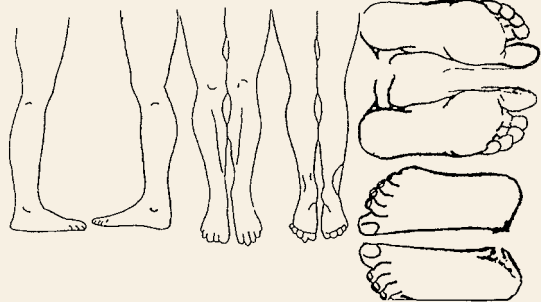
- Photograph all ulcers.
- Perform simple screening blood tests (full blood count and biochemical screen).
- Auto-antibody screen/rheumatoid factor if indicated.
- Ulcer swabs for microbial culture.
- doppler ultrasound limb arteries and treadmill testing for suspected arterial insufficiency.

Figure 2. The wound checklist in use at the RBH clinic.

WOUND CHECKLIST



	Requested	DATE Results received
Blood tests	<input type="checkbox"/>	<input type="checkbox"/>
Wound swab	<input type="checkbox"/>	<input type="checkbox"/>
Vascular lab	<input type="checkbox"/>	<input type="checkbox"/>
Minor op./biopsy	<input type="checkbox"/>	<input type="checkbox"/>
Photograph	<input type="checkbox"/>	<input type="checkbox"/>
Measurements		
Width		
Length		
Depth		
Dressing		
Compression		



- Duplex ultrasound (for venous ulcers).
- Biopsy of any suspicious lesions (such as irregular or nodular, or any pressure ulcer present more than 6 months).

Ulcers are subsequently categorised into the following groups, based on clinical findings from the above.

- Venous.
- Arterial, based on clinical findings (location, pain, pulse, ankle-brachial index).
- Diabetic.
- Rheumatoid/auto-immune disease (shown to have a higher rate of leg ulceration than age- and sex-matched contacts⁹).
- Infection-associated.
- Other/mixed.

Ongoing patient management

The aim of the ulcer clinic is to produce a clean, granulating surface that will heal either primarily or with the laying of a split

skin graft. Treatments are reviewed and altered frequently. The concept of a particular ulcer being static and requiring a single therapy is challenged. We aim to provide dynamic treatment for what is regarded as an ever-evolving and changing condition. All management plans begin with accurate assessment and diagnosis of any underlying conditions, followed by appropriate treatment. For example, patients are referred for limb revascularisation for ischaemic ulceration.

Venous leg ulcer management

The principles of venous leg ulcer management¹⁰ are as follows.

- Thorough initial assessment.
- Active treatment of infection.
- Effective compression therapy.
- Surgical debridement when indicated.
- Ongoing assessment and re-evaluation.
- In-patient management if required.

Active treatment of infection

The principle of avoiding systemic antibiotic therapy without clinical evidence of infection is followed^{4, 11}. Ulcers are regularly swabbed for bacterial culture and, when clinical signs of infection are present, topical antimicrobials such as SilvasineTM (Smith & Nephew, Clayton, Victoria) applied. These drugs are used for limited periods only, to prevent development of bacterial resistance. Surrounding skin is treated with tar and/or topical steroids to combat venous eczema, with systemic antibiotics reserved for use in cases of spreading infection or cellulitis.

Compression

With the support of much of the literature relating to the aetiology of chronic venous leg ulceration^{4, 8, 10}, it is the belief of this clinic that the most important form of local therapy is pressure. The aim of compression therapy is to control ambulatory venous hypertension, believed to be the cause of poor healing in response to tissue trauma⁴. Initially, a four-layer, low-stretch bandage system such as ProforeTM (Smith & Nephew, Clayton, Victoria) is used until swelling and wound ooze are controlled, at which time custom-fitted pressure garments are provided by the occupational therapy department.

Wound dressings

Wound dressings are reviewed on a weekly basis, in keeping with

the philosophy of the dynamic nature of wounds. Examination, followed by a discussion between nursing and medical staff, leads to agreement on the current state of the wound, the general effect required of a dressing and, finally, which one to use. The patient is invited to participate in this discussion. During the phase of detumescence, when the layered bandaging system is used, dressings that can be left undisturbed for up to a week are chosen. Foams, hydrofibers (often beneath hydrocolloid sheets), zinc paste and tar bandages may be used, depending on the amount of exudate present. Once oedema has been brought under control and healing has occurred, the patient is fitted with a customised pressure garment by the occupational therapy department.

The interior design of the ulcer clinic at the RBH incorporates a raised 'stage', on which ulcer patients are seated to allow easy access to their lower limbs (Figure 3).

Outpatient debridement

Patients with a non-infected, static wound the base of which consists of pale, fibrous tissue are advised to undergo debridement. This is performed by medical staff, with the aim of converting a chronic, non-healing wound into an acute, healing ulcer. A solution of 20 ml of bupivacaine 0.5 per cent with adrenaline 1:200,000 is applied to the ulcer on a gauze dressing for 20 minutes, with the ulcer subsequently debrided under aseptic conditions, using a scalpel blade to produce a bleeding surface which should then granulate. A calcium-rich alginate dressing is used to control any subsequent wound ooze.

Ongoing assessment

Clinic nursing staff perform assessments, which are recorded on the wound management record form (Figure 1) at each visit, with the aim of monitoring progress and determining the presence or absence of infection. Surgical specialists review ulcer clinic patients in their own outpatient clinics on a regular basis, at which time ongoing management is discussed and decided upon in conjunction with ulcer clinic personnel.

All chronic ulcers are biopsied at 6-monthly intervals, based on the results of several studies that recommend maintaining a high index of suspicion of malignancy in chronic ulcers, even in the absence of 'classic' signs of any malignancy¹². It is suggested that the only useful sign of malignancy is failure to respond to the usual therapy. A significantly higher rate of malignancy (around 4 per cent) was demonstrated in a recent Australian study, in comparison with overseas studies of incidence¹³.

In-patient management

In-patient management is indicated for the following.

- Systemic sepsis requiring intravenous antibiotics.
- An ulcer that is recalcitrant to outpatient management (see Figure 4).
- Certain social aspects – the patient cannot cope with home dressings or the ulcer is interfering with his/her ability to function independently at home.

Figure 3. The raised platform at the clinic has facilitated wound care and saved many a staff member's back.





Figure 4. This patient's venous leg ulcer had been present 17 years. Inpatient care for 3 weeks, including sequential compression devices and a skin graft, resulted in total and continued success.

Several new developments in the treatment of recalcitrant ulcers are currently under investigation. For the few patients whose oedema is not controlled by customised pressure garments, sequential compression devices can be used either continuously for inpatients or overnight for outpatients. Elevation of the limb in a Thomas splint can also provide a traditional solution for difficult wounds ¹⁴.

Outcomes

Introduction of a management form and register in 1997 improved the data available for review. In 1998, there were 112 new patients, whose diagnoses are listed in Table 1.

Of the 79 patients with venous ulcers, 30 did not have complicating factors like diabetes, rheumatoid arthritis, liver disease

Table 1. Types of leg ulceration at the RBH clinic.

Cause	Number
Venous	79
Arterial	5
Mixed venous/arterial	11
Diabetic (neuropathic)	6
Diabetic (neuro-ischaemic)	4
Other	7
Total	112

or infection. This group of patients had an average ulcer healing time of 4.6 weeks. The remaining 41 venous ulcers did have complicating factors – such as diabetes, infection, rheumatoid arthritis, systemic lupus erythematosus, Paget's disease or liver and renal disease – that delayed healing. Average healing time for this group was 23.9 weeks. Eight complicated venous cases carried over into the beginning of this year. In that category, five patients were admitted for split skin grafts that resulted in complete healing. Only three patients have required inpatient care in the last 12 months. It should be borne in mind that by the time patients are referred to the clinic their ulcers have often been present several years.

Chronic wounds are dynamic, and their management should reflect this. We believe optimum care is provided when a multi-disciplinary group manages patients with their sometimes difficult problems.

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