

CEPHRIS

Illawarra Leg Ulcer Clinic Evaluation Report 2002-3

Centre for Equity and Primary
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1. Executive Summary

1.1 Background

Leg ulcer treatment and management has been identified as placing high demands on both Community Health Services and General Practice in the Illawarra. It has been estimated that leg ulcers cost the Australian taxpayer between \$400 and \$500 million each year (MacLellan, 1997). The Illawarra Leg Ulcer Clinic is the product of several years of collaborative work involving the Illawarra Area Health Service, the Illawarra Division of General Practice and the University of Wollongong. The service was initiated following research that identified chronic leg ulcers as a prevalent health issue in the Illawarra and identified deficiencies in their effective treatment and management (Appendix 1). The establishment and continual improvement of services provided by the Illawarra Leg Ulcer Clinic exemplify how combining resources across services to address a common health issue can lead to more effective health care and positive health outcomes.

The IAHS Community Health Wound Care Committee was established in 1995 after a local survey found that leg ulcers comprised a high proportion of wounds being treated by Community Health Nurses in the Illawarra. The committee aimed to improve the quality of community based wound care across the area. In June 1995 the Illawarra Area Health Service in collaboration with the University of Wollongong, undertook the Illawarra Leg Ulcer Study (Hoskins, Ramstadius and Sibbald, 1997). The findings from this study were important in that they confirmed and identified major problems relating to the management of leg ulcers in the Illawarra. The key issues identified by the study were:

- More than half the study sample (52% of 330 clients with leg ulcers) had no formal diagnostic testing,
- Over 70% of ulcers remained unhealed after 3 months,
- Prolonged healing time necessitated costly long-term care.

The need for improved leg ulcer care became a major issue for both Community Health and General Practice. The development, implementation and evaluation of Wound Care Policy and Kit, by the Community Health Wound Care Committee in consultation with General Practitioners and other stakeholders, was an initial step to addressing some of the issues related to leg ulcer care (Blanchfield et al., 1998). Work carried out by community health nurses and recommendations from the Illawarra Leg Ulcer Study (Hoskins et al., 1997) prompted attempts by Illawarra Area Health Service staff and General Practitioners to establish a leg ulcer clinic in the area.

1.2 Rationale for the Establishment of the Illawarra leg Ulcer Clinic:

There is considerable evidence that the high cost of leg ulcer management can be substantially reduced with evidence-based protocols for treatment (Scottish Intercollegiate Guidelines Network, 1998). Research demonstrated that standardized protocols were not being adopted throughout the Illawarra and initial attempts at introducing a standardized approach, while partially successful did not meet with a high degree of compliance (Maisey et al. 1998). The existing evidence relating to leg ulcer management, together with the commitment and determination of the Area Wound Care Consultant, Community Nurses and key General Practitioners, led to support for the venture from Illawarra Area Health Service senior managers and the Illawarra Division of General Practice. This enabled a collaborative approach to planning and implementation that saw the clinic commence operation in May, 2002. The Illawarra Leg Ulcer Clinic was to provide specialist multidisciplinary care for unresponsive and complicated ulcers. The clinic team consists of General Practitioners, Community Health Nurses, the Wound Care Clinical Nurse Consultant, a nutritionist and administrative personnel. The introduction of a rotating roster for volunteer community nurses and general practitioners facilitated both a teaching and clinical role for the clinic.

1.3 The Evaluation Process

The following evaluation was conducted as a quality improvement exercise with the aims of assessing clinic processes and outcomes. The evaluation process commenced in May 2003 and was completed in November, 2003 and consisted of qualitative and quantitative components. Quantitative data was obtained from the clinic's routine data set for a twelve-month period commencing May, 2002. The qualitative component consisted of data collected from interviews with General Practitioners and Community Nurses working and memos from meetings with other staff involved with the clinic.

1.4 Evaluation Findings

Overall findings from the evaluation were positive and demonstrated the clinic was efficient and effective in managing unresponsive and complicated leg ulcers based on international benchmarks. The main findings were that 100% of clients referred received a formal diagnosis for their leg ulcers, and 63% of venous ulcers were healed in 8.2 weeks, which is lower than the adopted benchmark of 12 weeks. Also, recommendations for referral for non-venous ulcers were made to vascular surgeons and other relevant health professionals. Findings from the qualitative component of the study were also positive both in terms of process and outcomes. Community nurses and general practitioners working at the clinic believed that the holistic approach to assessment and care adopted by the clinic ensured that other health issues and concerns were addressed. They also identified areas for potential improvement relating to both access to services and operational factors. The evaluation process also highlighted the need for a review of the clinic database and data processing. All those working at the clinic perceived their experiences at the clinic increased both their knowledge and skills in relation to leg ulcer management. It was suggested that the clinic increase its teaching role to all Community Health nurses, practice nurses and new interns by accommodating their temporary placement at the clinic.

2. Background

2.1 Brief Description and Extent of the Health Issue the Clinic Aims to Address

Chronic leg ulcers are an incessant health problem in Australia and internationally, yet while a common and costly problem they have received relatively low priority in medicine (Gruen et al., 1996). Extrapolating UK cost estimates MacLellan (1997) estimated that leg ulcers cost the Australian taxpayer approximately \$400 to \$500 million each year. The major health costs attributed to these wounds relate to frequent home nursing visits, visits to general practitioners together with the cost of applied treatments (Johnson, 1995, Kerstein, 2003). In the Illawarra, the majority of leg ulcer care has customarily been provided by Community Health Nurses, with the frequency of home visits ranging from 1 to 3 per week (Hoskins, et al., 1997). Leg ulcers are generally wounds that are deeper than the skin layer and tend to have slow healing rates due to underlying pathology such as venous insufficiency, peripheral arterial disease, diabetes and vasculitis (Mekkes, et al., 2003).

Based on numerous studies conducted in Western countries during the past decade, the point prevalence for people with active leg ulcers is considered to be between 0.1% and 0.2% (Gruen, Chang, McClellan, 1996). This has been found to increase in older age with the population prevalence for leg ulcers has been estimated at between 1% and 2% in people aged over 60 years (Baker and Stacey, 1994; Johnson, 1995). Findings from Australian research have reflected these trends but of more concern are findings that have demonstrated the chronic nature of these wounds, and the frequency of repeated occurrences (Baker and Stacey, 1994; Hoskins et al., 1997; Morrell et al., 1998). Of particular relevance to health service delivery is evidence that suggests the chronic nature of leg ulcers is largely preventable; a large proportion of leg ulcer's healing rates can be improved by timely, correct diagnosis and treatment based on best practice guidelines (Scottish Intercollegiate Guidelines, 1998).

2.2 Processes leading up to the establishment of The Illawarra Leg Ulcer Clinic

The Illawarra Leg Ulcer Clinic evolved from several years of collaborative work involving Illawarra Area Health services, the Illawarra Division of General Practice and the University of Wollongong (Appendix 1). The process commenced with the recognition that wound management was placing considerable stress on Community Health Service resources. This concern prompted a local survey (Steele et al., 1993). The results of this survey led to Community Health pursuing further research with the University of Wollongong who conducted the Illawarra Leg Ulcer Study in partnership with the Wound Care Clinical Nurse Consultant and Community Health nurses, IAHS (Hoskins, et al., 1997). This research was instrumental in demonstrating the extent and nature of the problem and findings from the study prompted subsequent strategies aimed at improving leg ulcer management across the Illawarra.

2.2.1 The Northern Sector Wound Management Survey (Steele et al., 1993)

The aim of the wound management survey was to identify resources utilized in the management of wounds by community health nurses in the northern region of the Illawarra. Findings revealed that leg ulcers were the highest proportion of wounds being treated (42% of 7 wound categories) and related visits comprised 48% of the occasions of service for total wound care. The cost per visit was 54% higher than for other types of wounds (see Appendix 2). Evidence from this study contributed to the rationale for the Illawarra Leg Ulcer Study (Hoskins, et al., 1997).

2.2.2 The Illawarra Leg Ulcer Study (Hoskins, Ramstadius and Sibbald, 1997)

The Illawarra Leg Ulcer Study provided the Area Health Service with a baseline measure for leg ulcer prevalence as well as highlighting vital issues in the treatment and management of the leg ulcers across the area (Hoskins, et al., 1997). The point prevalence of leg ulcers in the total population of Illawarra/Shoalhaven (N=327, 550) was identified to be 0.01% and 0.63% for the population over 65 years of age (N=43,568). Of major concern were findings that over 50% of the sample (n=170 of 330) had not undergone any formal diagnostic procedures to identify the etiology of their leg ulcer, 70% of ulcers remained unhealed after 3 months of treatment and 44 different treatment products were being used. The study also found that only 34% of clients with venous leg ulcers were having appropriate compression bandaging applied (Hoskins et al, 1997). The findings and recommendations from this study prompted several strategies that were geared towards improving the effectiveness and efficiency of leg ulcer management across the Illawarra. These included: the establishment of a Community Health Wound Care Committee, the development of a Community Health wound care referral policy and kit, the review of the Area Wound Care Guidelines and in 1998 and 2002 and the establishment of the Illawarra Leg Ulcer Clinic.

2.2.3 The IAHS Community Health Wound Care Committee

The Community Health Wound Care Committee, formed in 1995, was instrumental in the introduction of the Community Health Wound Care Policy and Guidelines in 1998. Objectives for the policy and guidelines included standardizing the approach to wound care across Community Health as well as providing an educational resource for nurses and general practitioners ("The Wound Care Kit" Maisey et al., 1998). An evaluation undertaken after its implementation demonstrated an increase in the proportion of formal leg ulcer diagnoses, an increase in the proportion of investigations completed within 3 months of presentation and a decrease in the mean number of nursing visits. The estimated cost saving to Community Health for 23 clients for a three-month period in was \$14, 904 (Blanchfield et al. 2001). While results of the evaluation were encouraging, gaps in service provision were still evident in relation to the formal diagnosis of leg ulcers and highlighted a need for increased collaboration and improved continuity of care between service providers.

2.2.4 Review of Illawarra Area Health Service Wound Care Guidelines

The initial 1993 area guidelines for wound management (including leg ulcer management for hospital and community) were reviewed in 1998 and 2002. These were further developed as a teaching and clinical resource (Ramstadius, 2002). Efforts to establish a wound care clinic had also commenced and were driven by the Area Wound Care Clinical Nurse Consultant, a local General Practitioner and the Community Health Wound Care Committee. Early attempts met with limited success however, and it was not until interested parties adopted collaborative planning approach that substantial progress was made.

2.2.5 Planning and Implementation

Prompted by research findings, local evaluation of strategies to standardize leg ulcer management and unfruitful attempts to establish a clinic, shared interests and a pooling of resources led to a collaborative working party being formed. The group collected and reviewed the available reports and research information relating to operational models for leg ulcer clinics. Delegates from Community Health and the Illawarra Division of General Practice visited the Phillips Community Wound Care Clinic (ACT) to observe operations and discuss management issues. A three-tier model of service delivery based on the Phillips Community Wound Care Clinic Model (ACT) was proposed for the care of leg ulcers in the Illawarra (Table 1).

Table 1: Three tier model of service delivery (adapted from Phillips Community Clinic ACT)

Tier 1.	Community Health Nurse and General Practitioner management of simple uncomplicated leg ulcers.
Tier 2.	Specialist multidisciplinary clinic based services for unresponsive leg and complicated ulcers.
Tier 3.	Referred back to General Practitioner with recommendations for referral to a Specialist/Physician services for clients referred from tier 2.

A feasibility report was developed in consultation with the following stakeholders:

- Community Health Management and Nursing Staff including
- Illawarra Division of General Practice and General Practitioners
- Allied Health Professionals including Diabetes Clinic Staff, Dietician and Podiatrist
- Port Kembla Hospital Rehabilitation Outpatients' Unit
- Vascular Surgeons and Microbiologist

The proposed model adopted a combined management and operational approach by the Illawarra Area Health Service and the Illawarra Division of General Practice. Criteria for treatment at the clinic and protocols for referral were developed and evidence based clinical guidelines adopted (Scottish Intercollegiate Guidelines Network, 1998). The proposal was approved by the Illawarra Area Executive in October 2001 and the Clinic, based at Port Kembla Hospital, commenced operation in May, 2002.

3. Rationale for the Establishment of the Illawarra Leg Ulcer Clinic

There is considerable evidence that the high cost of leg ulcer management can be substantially reduced with standardized protocols for treatment. These protocols have demonstrated improved healing rates from 12% to 67% at 12 weeks, and from 22% to 81% at 24 weeks (Scottish Intercollegiate Guidelines Network, 1998). Research findings (Hoskins et al., 1997) and evaluation of the adoption of Community Health wound care policy and guidelines strongly suggested that the initial and crucial phase of leg ulcer management, formal diagnosis, was not being carried out for the majority of clients. It was anticipated that clients' attending a leg ulcer clinic would ensure formal diagnosis and facilitate subsequent treatment. It was expected that this in turn would improve healing rates and reduce associated treatment costs for both general practice and Community Health.

3.1 Clinic Objectives

- In line with recent research (Scottish Intercollegiate Guidelines Network, 1998) the primary aim of the clinic was to reach the accepted benchmark by reducing healing times for 12% to 67% of venous leg ulcers to 12 weeks. This would be achieved by adopting a systematic, evidence based approach to diagnosis and appropriate treatment.
- The clinic aimed to reduce health care costs. It was anticipated that a reduced healing time for venous leg ulcers would substantially reduce related health care costs as well as improve the general health and wellbeing of clients diagnosed with venous leg ulcers.
- The clinic also aimed to ensure that all clients attending the clinic would receive a correct diagnosis of underlying factors causing their leg ulcers.
- Correct diagnosis would enable the recommendation for referral of non-venous ulcers to expert clinicians.

The scope of the clinic's aims, while focused on the treatment of venous leg ulcers also included the management of other types of leg ulcers.

The recognition that leg ulcers often stem from conditions that can be attributed to lifestyle factors such as obesity and smoking led to the adoption of a holistic approach to optimum client care. Strategies to facilitate the clinic's approach to leg ulcer management include:

- Client involvement in the development of a comprehensive care plan
- Regular evaluation of the treatment plan by the client and doctor
- Appropriate education and information to enable clients to make informed choices
- Ensuring client access to evidence based clinical interventions and expert clinicians
- Timely and comprehensive feed back to referring clinicians
- Adopting a shared learning approach to the clinic's operation

4. General Information about the Clinic

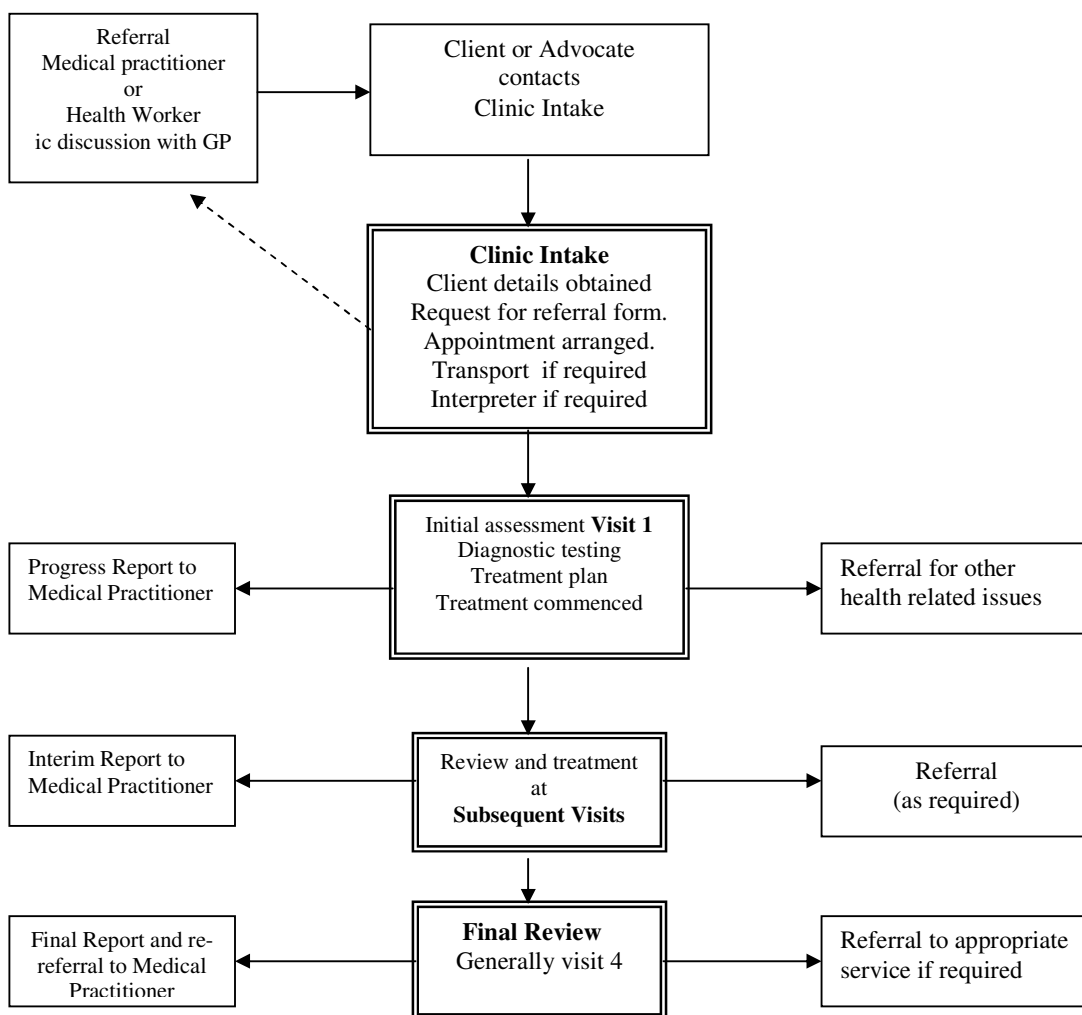
The clinic is conducted one morning per fortnight and is staffed by an administrative assistant, the Clinical Nurse Consultant for wound care, a General Practitioner and two Community Health Nurses. Staffing is organized with a rotating roster; medical staff rotate fortnightly and nursing staff rotate quarterly. The Area Wound Care Clinical Nurse Consultant who attends each session oversees client care and education. Illawarra Health funds the majority of operational costs with nursing and administrative salaries being met by Community Health Services. General Practitioners are reimbursed for their services through Medicare payments.

Referrals to the clinic are accepted from doctors and other health workers. A requirement of the clinic is that, where possible, the standardized referral form be completed by the client's General Practitioner. During the evaluation time frame, the criteria for referral was that the client have a leg ulcer of 4 weeks duration or longer (Tier 2 of the leg ulcer management model, p5).

The initial visit is structured to obtain a formal ulcer diagnosis. A medical history is completed (referral information and history taken), each client is assessed ankle brachial index is obtained using a Dopplar probe and other relevant investigations are ordered (Table 4, p14). On the subsequent visit, clients with non-venous ulcers and ulcers that do not meet the clinics treatment criteria are referred back to their general practitioner with diagnostic results and follow-up recommendations.

Clients who have been diagnosed with venous ulcers and/or other ulcers that can be treated by the clinic (eg. those caused by trauma or cellulitis) are involved in the development of their treatment plan and the appropriate treatment commenced. Clients are generally allocated four visits to the clinic however, additional visits are sometimes required for complicated and/or multiple ulcers.

Figure1: The Illawarra Leg Ulcer Clinic Referral Process



4.1 Approach to Client Care and Follow-up

The clinic operates on the premise that several factors contribute to positive client outcomes. These include a correct diagnosis, evidence-based treatment of the presenting condition, treatment and/or management of underlying or contributing conditions and the involvement of clients in their own care. Together with expert care and evidence based treatment, these processes are facilitated by client education and support as well as close collaboration with other caregivers such as family, community nurses, the client's medical practitioner(s) and other involved professionals.

Client education is geared towards self-management in the community setting and considers both the ability and willingness of the client to participate in their own care. The availability of support and lifestyle factors are also considered in the treatment plan which is developed with, and tailored for, each individual client.

5. The Evaluation

5.1 Introduction

This component of the report summarizes the findings of the evaluation of the Illawarra Leg Ulcer Clinic. CEPHRIS (Centre for Equity and Primary Health Care in the Illawarra and Shoalhaven) was asked to evaluate the overall effectiveness and outcomes for the clinic and commenced the evaluation process in May 2003. The scope of this evaluation was limited in that it was based largely on existing data collected by the clinic. The study did not introduce additional measures such as client satisfaction or quality of life indicators due to the short time frame for the evaluation. These will be addressed by subsequent evaluation.

5.2 Method

The current evaluation has two components:

1. A quantitative evaluation that describes clients accessing the clinic, their utilization patterns and their diagnosis. It also describes treatments and related treatment outcomes.
2. A qualitative component that examines the perceived strengths of the clinic model and processes and areas for potential improvement.

Quantitative data was obtained exclusively from the clinic data-base (Access 2000) which had been designed and implemented prior the commencement of clinic operations. It included the routine data set for all clients seen at the clinic over a twelve-month period commencing in May, 2002. The data was analyzed using descriptive statistics with SPSS 11.5.

The scope for the qualitative component of this evaluation was restricted to provider data. This was obtained from semi-structured interviews with a sample consisting of 3 nurses and 3 GPs who were employed at the clinic (total staffing was 6 GPs and 6 Community Nurses) and a focused meeting with other doctors working at the clinic. Areas for discussion at the meetings related to different aspects of the clinic's operation and included participants' overall opinion about the clinic as well as what they thought was functioning well and what they felt could be improved. They were also asked to comment on issues raised during previous interviews in order to gain a broader perspective. A draft report containing a preliminary analysis of interview data was then forwarded for comment to all those who had worked at the clinic. Responses from this latter phase of the review process were considered as data and incorporated into this final report.

5.3 Quantitative Analysis - Results

This section of the report provides an overview of all clients that presenting at the Illawarra Leg Ulcer Clinic over the evaluation period. As clients with non-venous ulcers are usually discharged to their General Practitioner with recommendations for appropriate referral the primary focus of this section of the report is on the management of venous ulcers.

5.3.1 The Evaluation Sample

5.3.1.1 Age and Gender

Data for the total of 80 clients who attended the clinic during the evaluation period was included in the quantitative analysis. The client sample consisted of 36 males and 44 females (Figure 2) whose ages ranged from 45 years to 95 years with a mean age of 75 years (Table 2). The mean age for females was 80 years and for males 69 years.*

Figure 2: Client Gender

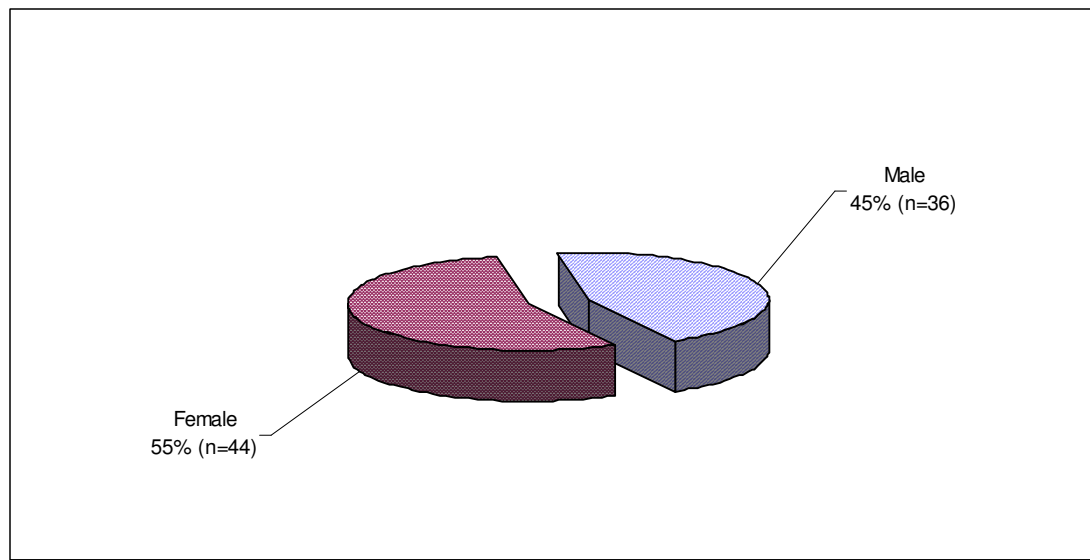


Table 2: Client Age

	Mean	<i>Median</i>	Range
Overall Sample (n=80)	75 yrs	77yrs	45 yrs to 95 yrs
Males (n=36)	69 yrs	72 yrs	48 yrs to 89 yrs
Females (n=44)	80 yrs	80yrs	45 yrs to 95 yrs

*Data for 1 (n=1) client was excluded from the overall analysis as related variables could not be discretely identified.

5.3.1.2 Ethnicity

Client ethnicity could not be accurately determined as language was the only related variable included on the database. Of the sample (n=80), a total of 72 clients were recorded as speaking English and 4 clients spoke languages other than English (Greek, Macedonian x 2 and Polish). No data relating to language was recorded for 4 clients. Feedback from GPs and nurses working at the clinic suggests that the proportion of clients from non-English speaking backgrounds was higher than suggested by language alone.

5.3.1.3 Client Locality

A total of 80 clients from 15 different Illawarra postcode areas across were referred to the clinic. The postcode area for clients with the most referrals was the Kiama area, followed by Wollongong, then Unanderra and Warilla. Postcodes have been graphed for the two Illawarra Area Health Regions (Figure 3 and 4).

Figure 3: Number of Clients from North Central Region IAHS

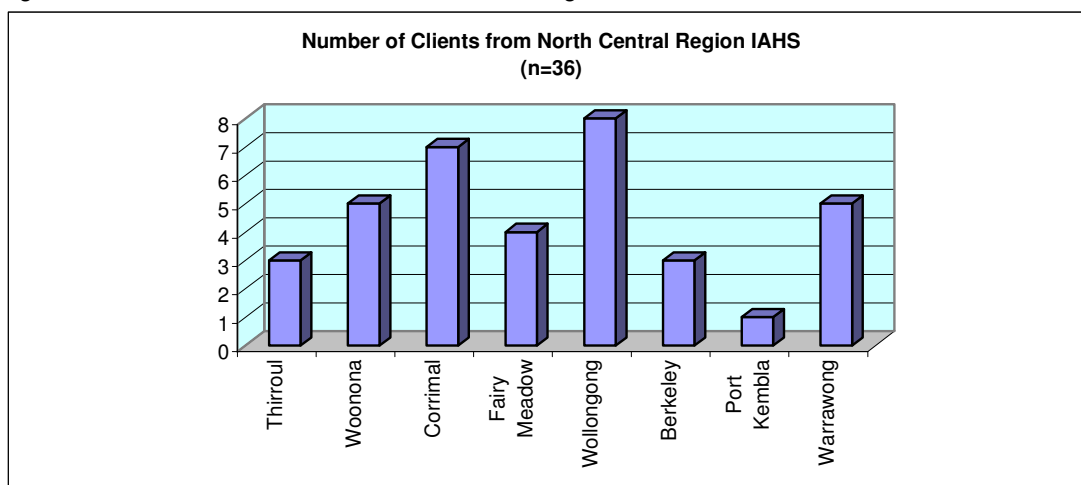
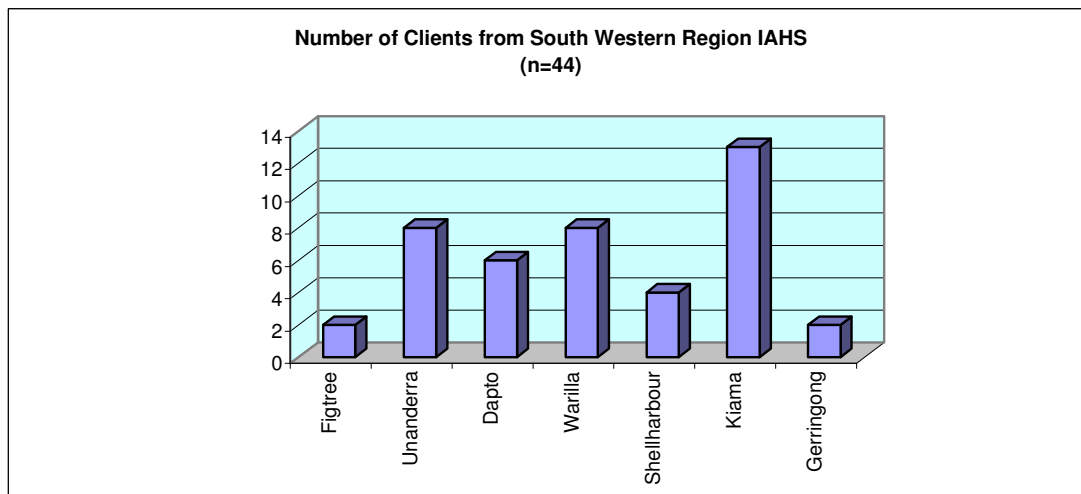


Figure 4: Number of Clients from South Western Region IAHS



5.3.2 Client Co-morbidity

The Illawarra Leg Ulcer Clinic adopts a holistic approach to leg ulcer management. This involves an individual assessment of each client and a strong emphasis on ensuring the client is treated for the underlying condition that predisposes the client to ulceration.

Of the 80 clients that attended the Illawarra Leg Ulcer Clinic during the evaluation period, 68 were recorded as having other existing medical conditions; this information was either obtained from the referring doctor and/or at the client's initial visit to the clinic. A total of 181 conditions were recorded for the evaluation sample (n=68). The number of co-morbidities for individual clients ranged from 1 to 9 with the mean being 2.7 (Figure 6). The most prevalent conditions were hypertension (n=36), arthritis (rheumatoid arthritis = 4, osteoarthritis = 23), cardiovascular disease (n=25), and diabetes (n=19; NIDDM =12, IDDM = 3, not specified = 4).

Figure 5: Co-morbidities for all clients attending the clinic (not including 14 = no co-morbidity)

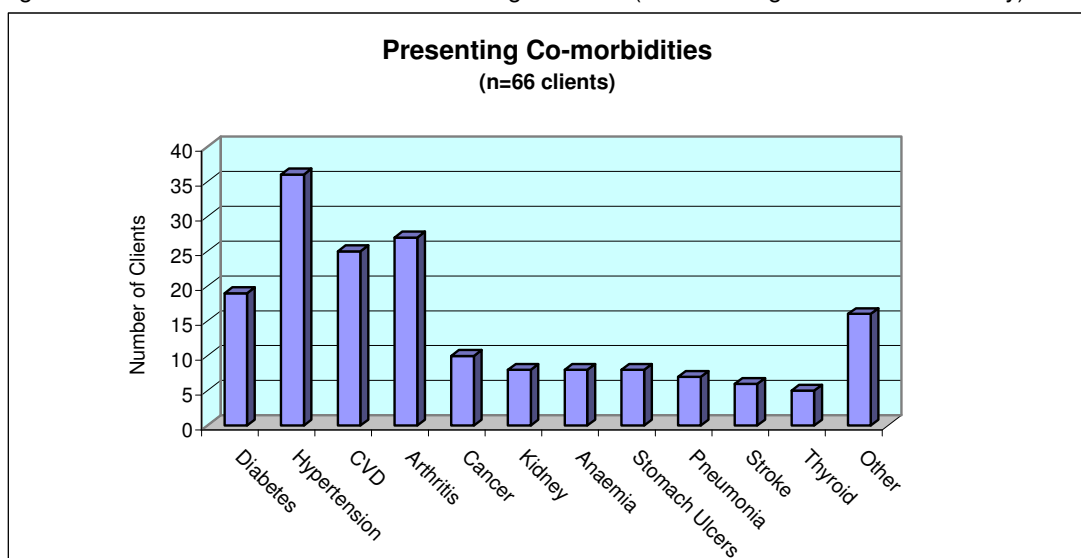
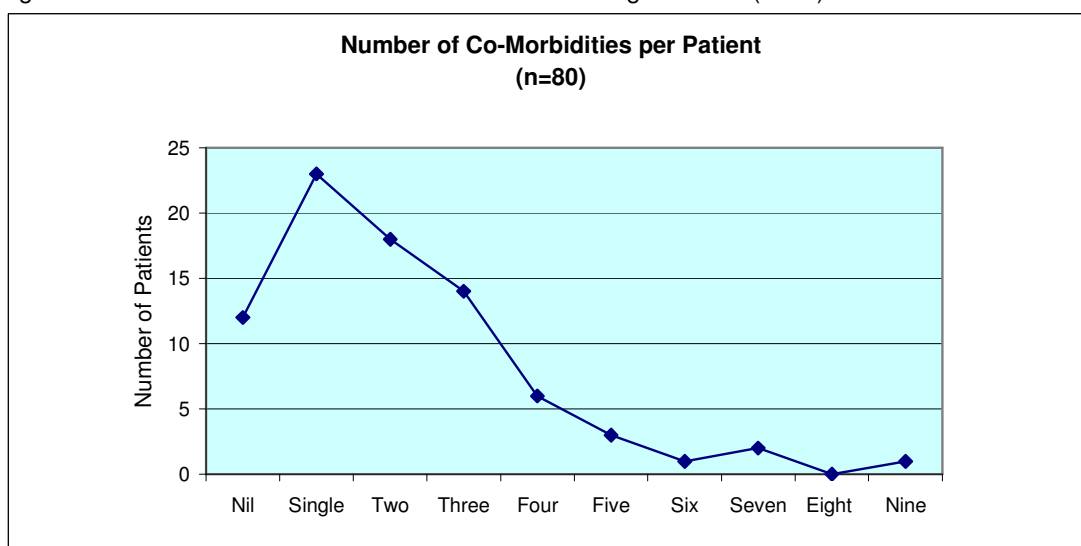


Figure 6: Number of co-morbidities for all clients attending the clinic (n=80).



5.3.3 Presenting Ulcers

5.3.3.1 Site of Ulceration

A total of 116 ulcer sites and 110 individual ulcers were recorded for the 80 clients who presented at the clinic during the evaluation period. Site data for clients with multiple ulcers was not discrete; the total number of ulcers was calculated in the following way:

- Clients with ulcer sites on separate limbs were counted as having 2 ulcers.
- Clients with multiple sites on the same limb (ie. leg and foot) were counted as having 1 ulcer (two if multiple sites on both legs).
- Clients with missing site data and other confirming data (such as diagnosis, visits, healed date etc) were counted as having one ulcer.

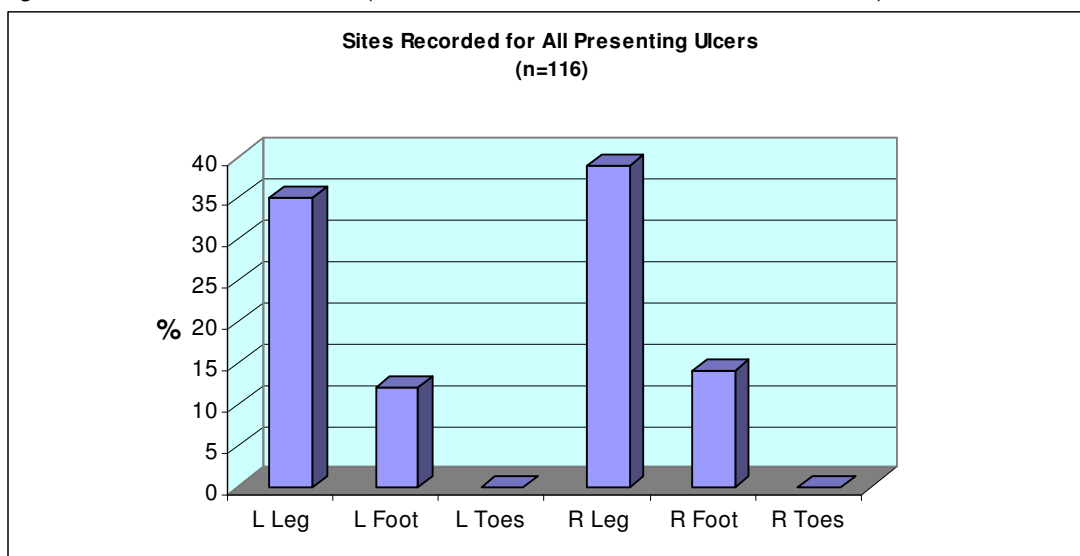
Of the presenting clients (n=80), 65 were recorded as having an ulcer on a single site either leg, foot or toes, 19 were recorded as having two ulcers (separate limbs), 1 was recorded as having 2 ulcers with three sites (leg and foot plus leg) and 2 as having two ulcers on both limbs (table 3). As data for each ulcer was not discrete.

Table 3: Recorded Client Ulcer Sites (sites =116, ulcers = 110)

Single Site	Two Sites Separate Limbs	Two Sites same limb (extended)	Three Sites (one extended)	Four Sites (2 extended)
65	19	1	1	2

The ulcer sites shown in Figure 8 were calculated from the entire sample of clients seen at the clinic during the evaluation period including those that had not yet received a formal diagnosis (n=80). Ulcer site was recorded on the initial visit and prior to investigations being ordered.

Figure 7: All recorded ulcer sites (6 extended ulcers included, total ulcers = 110)



* Ulcer sites =116, ulcers =110.

5.3.3.2 Assessment

Assessment of clients for the purpose of obtaining a formal ulcer diagnosis included the investigations detailed in Table 4. All clients attending the clinic had their ankle brachial index measured with a hand held Doppler probe, blood sugar levels tested and monofilament investigations ordered. Other investigations were ordered if considered necessary for obtaining ulcer diagnosis and if they had not recently been ordered by the client's general practitioner.

Table 4: Investigations Ordered and Carried Out

(n=80)	ABI ankle brachial index	Mono- Filament	Biopsy	FBC (full blood count)	UEC (urea, electrolytes creatinine)	BSL (blood sugar level)	Albumin	Wound Swab	Other
No of									
Clients	80	80	10	45	38	80	26	12	1

5.3.3.3 Ulcer Diagnoses (Clients)

Ulcer diagnoses were obtained for 76 of the 80 clients attending the clinic during the 12 month study period. Diagnostic investigations had been ordered for the remaining 4 clients (initial visit to the clinic was one week prior to the cut off for the evaluation which left insufficient time for processing). Excluding the four clients awaiting investigation results, 100% of clients received a formal ulcer diagnosis. A total of 87 ulcer diagnosis were made for the 76 clients who received diagnostic results (Table 5, Figure 8)*.

Seven of the clients (n=7) were given two different diagnoses for separate ulcers, these were:

- arterial and venous (n=2)
- arterial and vasculitic (n=1)
- arterial and traumatic (n=1)
- arterial and diabetic (n=2)
- malignant and venous (n=1)

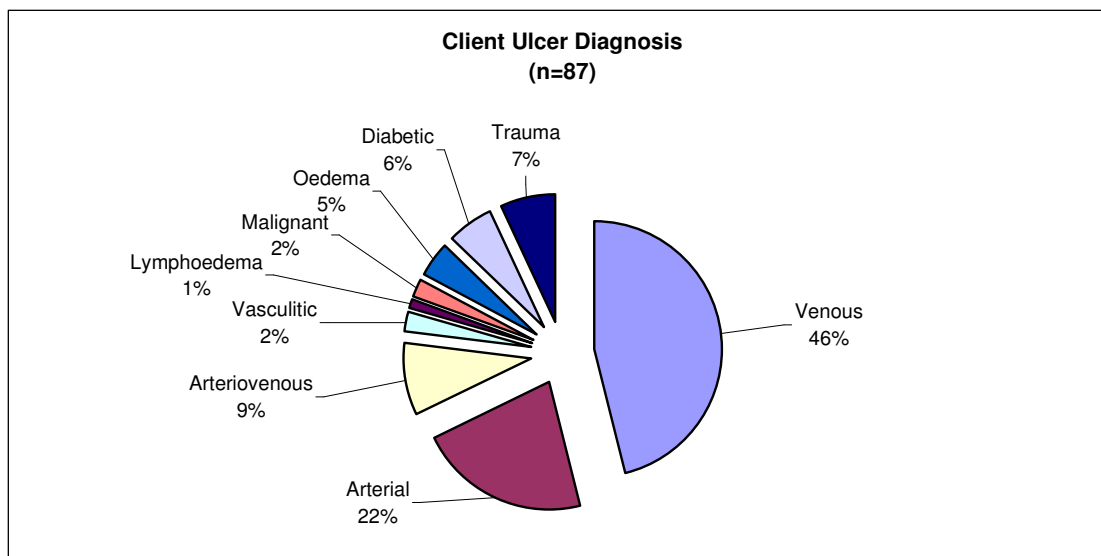
Two clients were re-referred to the clinic and given a diagnosis for new venous ulcers (n=2) and one client was diagnosed with a recurring varicose ulcer (n=1)

Table 5: Client Ulcer Diagnoses (87)

Venous	Arterial	Arterio- venous	Vasculitic	Lymph- oedema	Malignant	Oedema	Diabetic	Traumatic
40	19	8	2	1	2	4	5	6

*Diagnostic data for individual ulcers of the same aetiology was not discrete (ie. clients with multiple ulcers of the same aetiology were given a single diagnosis).

Figure 8: Client Ulcer Diagnoses (%)



*This table includes the number of diagnosis per client and not diagnosis for multiple ulcers of the same diagnosis (n=9). It does include clients re-referred for new ulcers (n=2).

5.3.3.4 Ulcer Diagnoses (all ulcers)

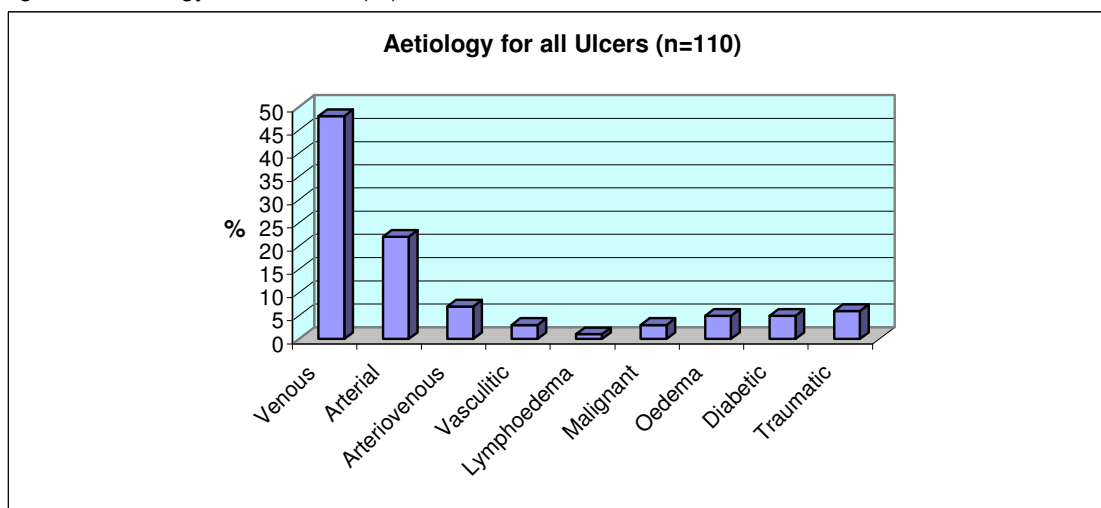
A total of 110 separate ulcers were diagnosed for 76 of the 80 clients attending the clinic with nine categories of leg ulcer aetiology recorded (Table 6).

Table 6: Aetiology for all Presenting Ulcers (number)

Venous	Arterial	Arterio-venous	Vasculitic	Lymph-oedema	Malignant	Oedema	Diabetic	Traumatic
54	24	8	3	1	3	5	5	7

*Ulcers covering two sites on the same limb (ie. leg and foot) have been classified as single ulcers.

Figure 9: Aetiology for all Ulcers (%)



*Ulcers covering two sites on the same limb (ie. leg and foot) have been classified as single ulcers.

5.3.3.5: Referrals made from the clinic

Clinic protocols exist for clients with non-venous ulcers requiring further treatment. Once a formal ulcer diagnosis has been obtained clients requiring follow-up from other health professionals are re-referred to their General Practitioners with the relevant recommendations for referral. There are currently no protocols for obtaining feedback from General Practitioners for clients who are re-referred making client follow-up by the clinic difficult.

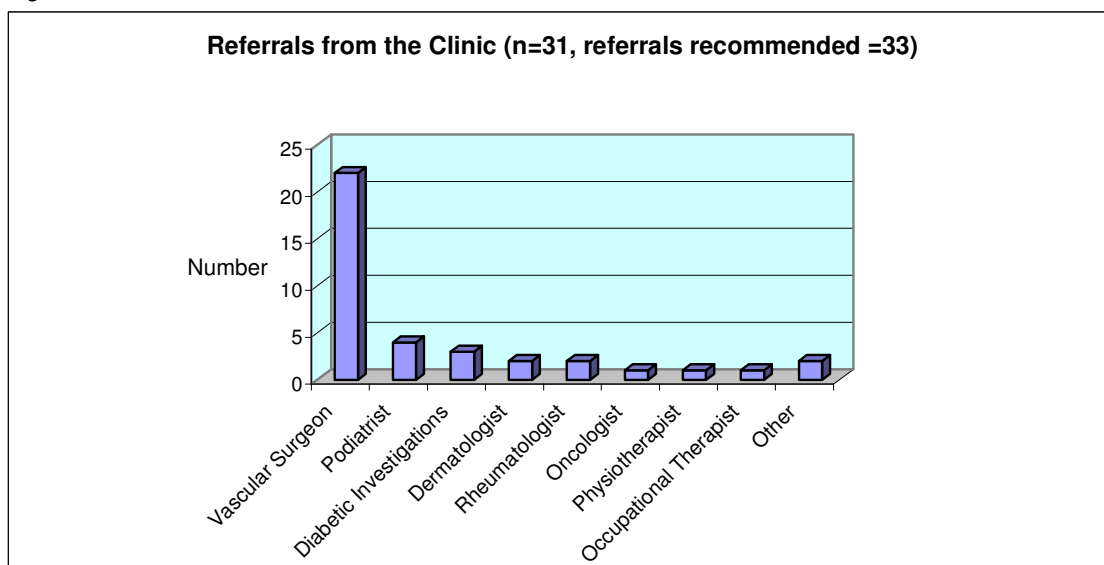
Recommendations for referral to other health professionals for further investigations and/or follow-up were made for a total of 33 of the 80 clients who attended the clinic during the evaluation period. The majority of the recommendations were for follow-up by vascular surgeons (n=22) and included 15 clients diagnosed with arterial ulcers (Figure 10). The category of other (n=2) included hospital and vascular studies. In total 80% of clients with non-venous ulcers were re-referred to their general practitioner with recommendations for referral to specialist health professionals.

There were clients (n=7) who, after having received an ulcer diagnosis, were recorded as “lost to follow-up”. This variable was defined as clients who were either non-compliant or who refused further treatment. These clients were referred back to their General Practitioner and were diagnosed as having the following ulcer aetiologies:

- arterial (n=3),
- arteriovenous (n=1),
- vasculitic (n=1)
- venous (n=2).

Criteria for defining non-compliance in relation to ulcer treatment and protocols for discharging and referring these clients from the clinic are currently being developed.

Figure 10: Recommended Referrals to Other Health Professionals



*Non-compliant and clients refusing further treatment not included.

5.3.4 Venous Ulcers

Ulcers below the knee with ankle/brachial index of >1.0 , and no evidence of skin cancer or non-venous aetiology were recorded as venous ulcers. Exceptions to this were ulcers with ankle/brachial index >1.25 , further investigations were ordered due to the possibility of arterial calcification.

A total of 40 individual clients were diagnosed as having a total of 54 venous ulcers. Three clients had a repeat episode of venous ulcers during the study period (data indicated they were distinct ulcers of different durations). * No recurring venous ulcers were recorded. Data for venous ulcer sites was not discrete in terms of number of ulcers; the number of individual ulcers was calculated in the following way for individual clients:

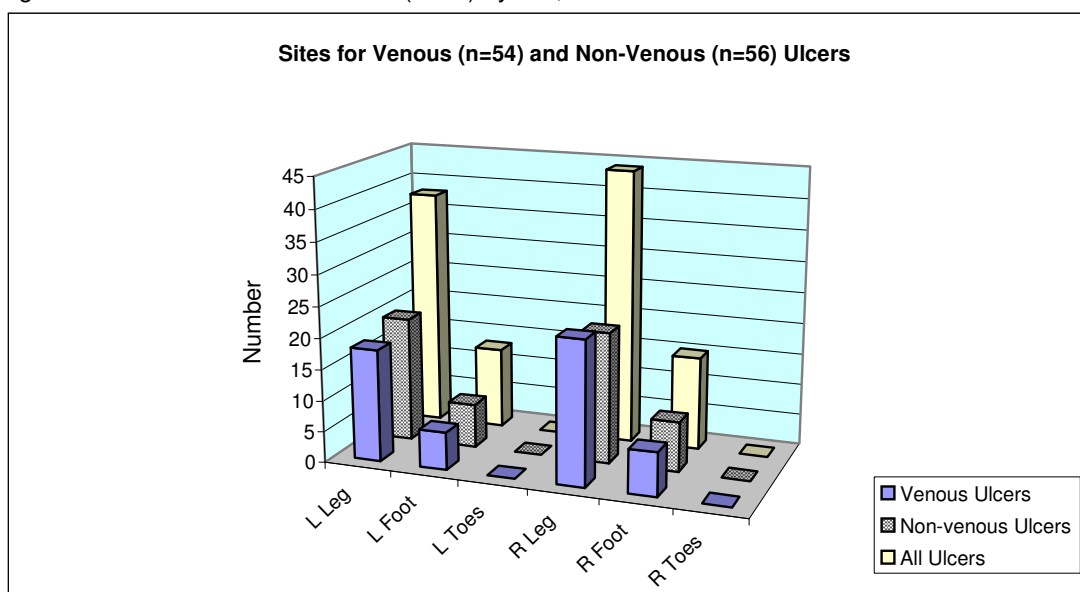
- Single site = 1 ulcer
- Two sites on separate legs = 2 ulcers
- Two sites on one limb ie. possible extended ulcer = 1 ulcer

The following calculations refer to either client diagnoses and others to separate ulcer sites.

5.3.4.1 Venous Ulcer Sites

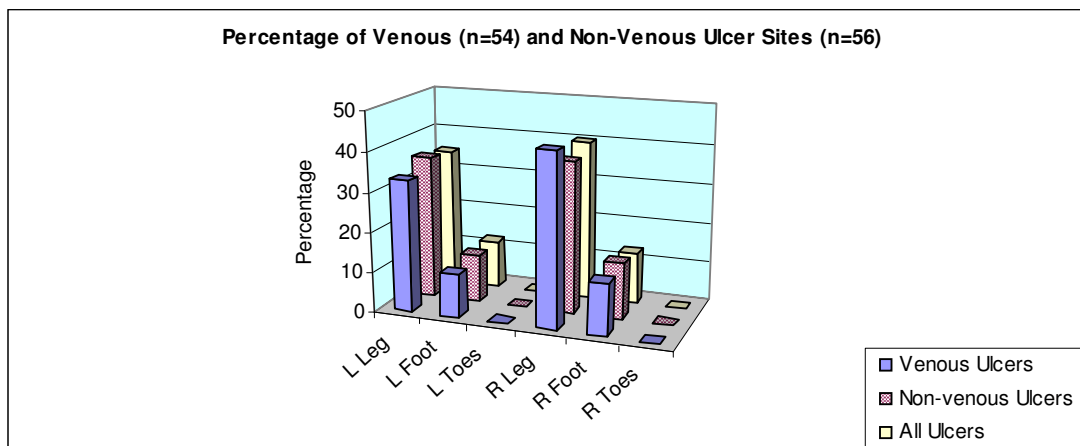
The occurrence of venous leg ulcers by site is depicted in figures 11 and 12. There was little difference in the site distribution for venous and non-venous ulcers with most ulcers occurring on the leg between the knee and foot. No ulcers were recorded on the toes for the study sample. Twenty clients were recorded as having ulcers on both legs and three clients (n=3) had ulcers that extended from the leg to the foot area; ulcer diagnoses for these clients were: malignant (n=1, both legs), arterial (n=2) and venous (n=1).

Figure 11: Number of venous ulcers (n=54) by site, non-venous ulcers =56.



Venous Ulcers = 54, Non-Venous = 56, All Ulcers =110

Figure 12: Percentage of venous ulcers by site



5.3.4.2 Venous Ulcer History Prior to Clinic Assessment

In most cases ulcer history (duration of ulcer prior to first clinic visit) was entered for individual clients rather than individual ulcers. Ulcer history for individual ulcers could only be assessed where there were separate referrals for clients with multiple ulcers, where a single diagnosis was connected to a single ulcer site, and when clients had a separate series of visits for each ulcer. The following calculations for ulcer duration are based on clients' healing time for their venous ulcers in total (single or multiple). Given that clients were discharged on healing, where a single client had multiple venous ulcers (n=14) it can be assumed that their ulcers healed on or before the healed date. Descriptive statistics were calculated with and without outlying values (2 outliers with values of 1040 weeks and 1976 weeks for 7a and 7c).

Table 7. Descriptive Statistics for Duration of Venous Ulcers Prior to Referral

7a. All Clients with Venous Ulcers

	N	Minimum	Maximum	Mean	Std. Deviation
Duration in Weeks (outliers excluded)	38	4.00	208.00	32.32	42.48
<i>Duration in Weeks (including outliers)</i>	<i>40</i>	<i>4.00</i>	<i>1976.00</i>	<i>106.10</i>	<i>345.01</i>

7b. Clients with Healed Venous Ulcers

	N	Minimum	Maximum	Mean	Std. Deviation
Duration in Weeks	26	4.00	208.00	29.08	39.69

*No outliers for healed venous ulcers

7c. Clients with Unhealed Venous Ulcers

	N	Minimum	Maximum	Mean	Std. Deviation
Duration in Weeks (outliers excluded)	12	4.00	182.00	39.33	49.11
<i>Duration in Weeks (including outliers)</i>	<i>14</i>	<i>4.00</i>	<i>1976.00</i>	<i>249.14</i>	<i>565.84</i>

7d. Quantiles for Healed and Unhealed Venous Ulcers

Quantiles

Healed Venous Ulcers			Unhealed Venous Ulcers		
maximum	100%	208.00	maximum	100%	182.00
	99.5%	208.00		99.5%	182.00
	97.5%	208.00		97.5%	182.00
	90%	59.80		90%	150.8
quartile	75%	26.00	quartile	75%	40.75
median	50%	23.00	median	50%	26.00
quartile	25%	12.00	quartile	25%	13.00
	10%	6.00		10%	5.20
	2.5%	4.00		2.5%	4.00
	0.5%	4.00		0.5%	4.00
minimum	0.0%	4.00	minimum	0.0%	4.00

Excluding outliers, duration for healed and unhealed ulcers prior to the initial clinic visit was not normally distributed for each group; quantiles for each group are listed in Table 7d. Prior to applying an independent samples T-Test common log (10) was applied to the data. The Shapiro-Wilk W Test for normality yielded a probability >0.05 (0.9413). Results of the independent samples t-test comparing ulcer duration for the healed and unhealed groups found no significant difference between the means for the two groups (2-tailed sig. <0.05 level [t value = 0.4891]; df =36).

5.3.4.3 Treatment of Venous Leg Ulcers

The treatment of venous leg ulcers at the clinic is based on individual client assessments that take clients' underlying conditions into account.

Primary Dressings

The primary dressings for venous ulcers are dependent on the ulcer base and take factors such as exudate, colour, smell and depth into account. The type of pressure bandaging that is considered most suitable also impacts on the choice of primary dressing. Generally, a non-stick surface is applied to the wound (some incorporated in compression bandage) however a topical dressing is sometimes applied. Dressings impregnated with a topical medication used by the clinic include:

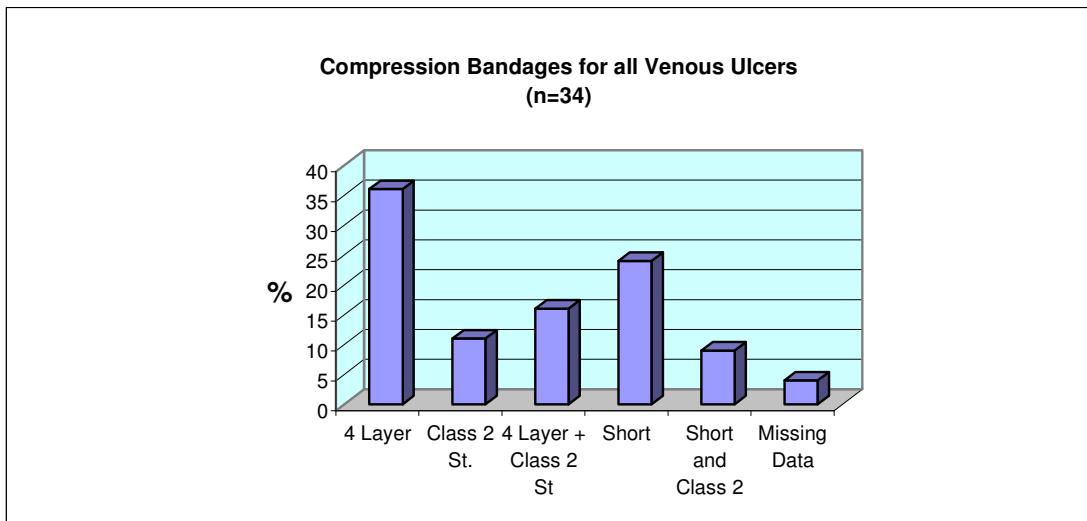
- foam and silver (eg. Avance)
- honey (eg. Medi-Honey)

Secondary Dressings

All people with venous ulcers (unless there are specific contraindications) are treated with compression bandaging. Thirty-four (n=34) of the forty (n=40) venous ulcer clients were recorded as being treated with compression bandaging; related data was not entered for the remaining clients (missing data for 6 clients [figure 13] with a total of 9 ulcers [figure 14]). Bandages applied to venous ulcers included:

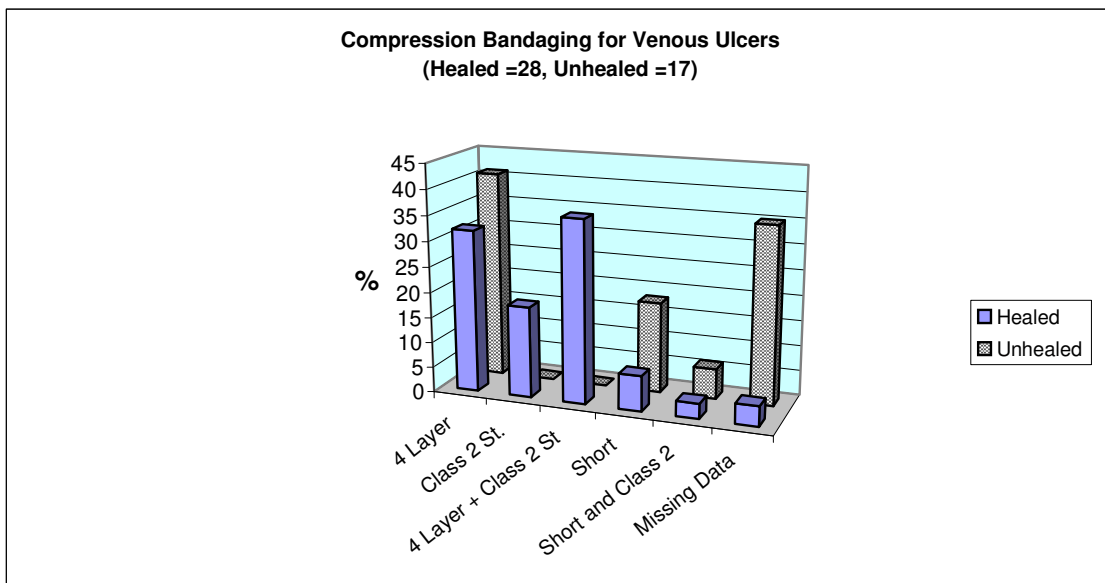
- four layer compression bandages (Profore)
- class two high stretch (eg. Setopress)
- short stretch (eg. Comprilan)
- combination of stockings and bandages

Figure 13: Compression Bandages Applied to Venous Ulcers



*Missing data for 6 clients with a total of 9 venous ulcer sites.

Figure 14: Compression Bandages for Healed and Unhealed Venous Ulcers.

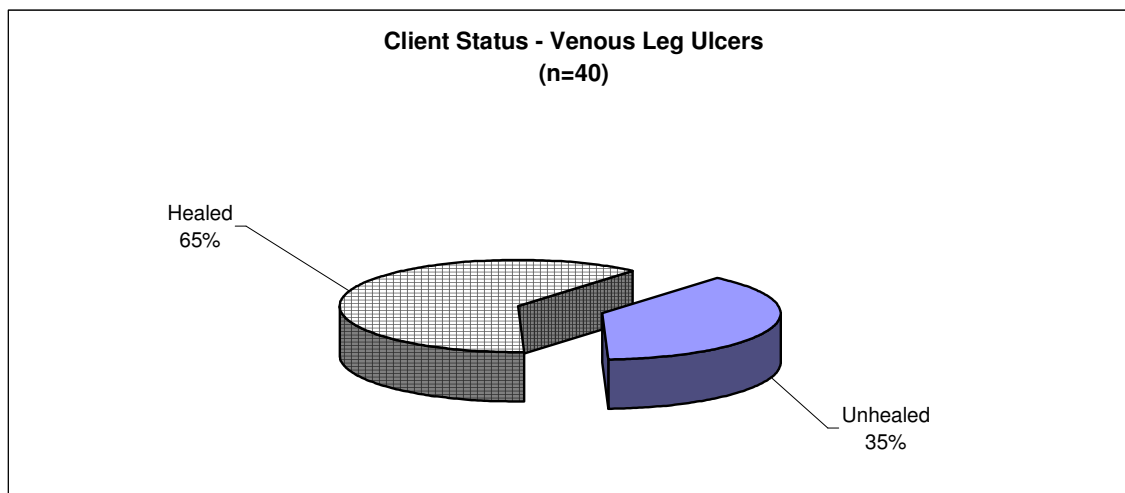


*Missing data for 9 venous ulcer sites

5.3.4.2 Outcomes Relating to Venous Leg Ulcers

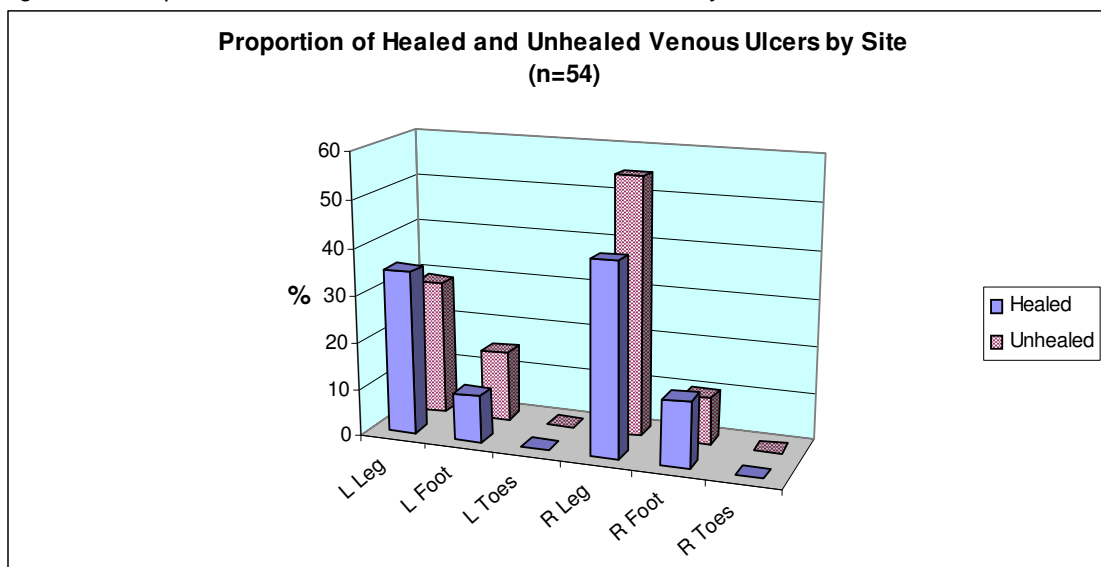
Of the forty (n=40) individual clients diagnosed venous ulcers twenty-six clients (n=26, 65%) were recorded as healed during the evaluation period (Figure 15). Fourteen clients (n=14, 35%) remained unhealed. The mean healing time for the healed venous ulcer group was 8.2 weeks.

Figure 15: Client Status - Venous Leg Ulcers



The proportion of healed compared to unhealed venous ulcers (total venous ulcers =54) was slightly lower than client ulcer status (Figure15). Client venous ulcer status was 65% (healed clients) and 35% (unhealed clients) compared to the proportion of discrete venous ulcers which was 63% and 37% respectively. The variance can be explained by the mean number of ulcers per client being slightly higher in the unhealed group (1.4 compared to 1.1 per client). The proportion of healed and unhealed ulcers for each site is depicted in Figure 16.

Figure 16: Proportion of Healed and Unhealed Venous Ulcers by Site



5.3.4.3. *Healing Time and Clinic Visits*

Data relating to clinic visits was mainly restricted to healed ulcers (Table 8) and did not permit calculations for the number of clinic visits for unhealed ulcers and a comparison could not be made for the two groups. Number of clinic visits was recorded on client discharge. An “unhealed” status at the end of the data collection period also meant that a finite figure healing time for ulcers based on visits could not be estimated however a minimum healing time for unhealed clients was calculated as described below.

“Healing time” for healed ulcers (in weeks) was calculated as the time between the initial visit and “healed date” (final visit). The minimum healing time for unhealed ulcers was calculated in a similar way with the last day of data collection being the measure that substitutes for the final visit date. The average period of clinic attendance for healed ulcers was 8.2 weeks and the estimated mean for unhealed clients was >26 weeks (Table 8).

Table 8. Visits and healing times for venous ulcer clients

	Healed (n=26; 65%)	Unhealed (n=14; 35%)
	29 weeks	39 weeks
Mean duration of ulcer prior to initial clinic visit	N/A	249 weeks
	<i>Including outliers</i>	
	2.6 visits	Documented on healing
Mean number of visits (multiple ulcers treated on single visit)		
Mean healing time per ulcer	7.6 weeks	> 26.5 weeks (n=11) Healing time documented on healing*

* 3 clients lost to follow up were excluded from the calculations

5.3.4.3 *Predictors of Healing and Healing Time*

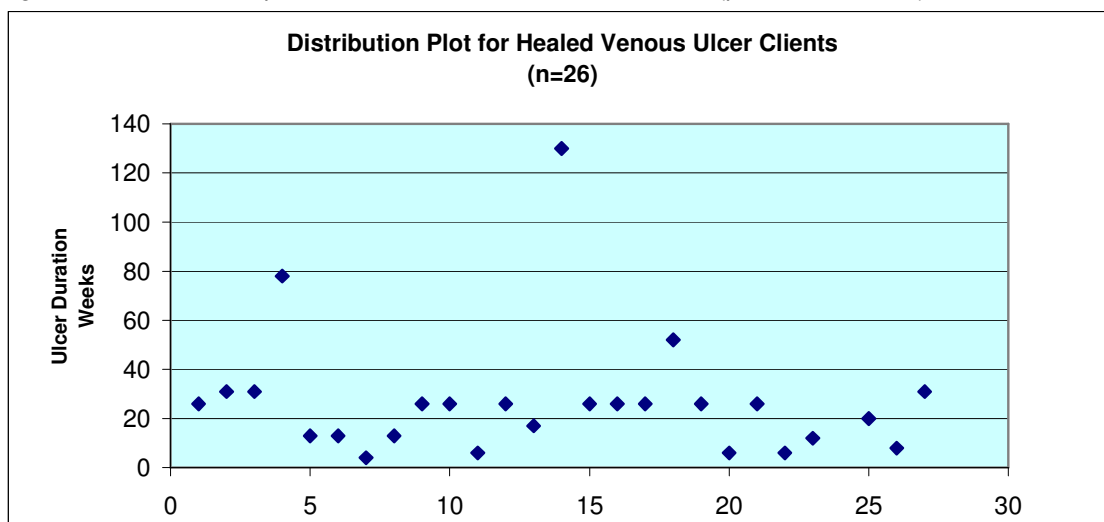
Regression analyses were carried out on client demographic variables, client co-morbidities and ulcer duration to estimate whether they were possible predictors of venous ulcer healing (healed vs unhealed) and healing time as the dependent variables. Results of the following analyses need to be interpreted with considerable caution due to the small sample size for clients with venous ulcers (n=40), the number of clients with healed venous ulcers (n=26) and groupings for other variables. No significant results were found for the predictors of age, gender, or whether clients were smokers in relation to whether venous ulcers were healed or remained unhealed.

An independent samples T-test compared the mean ulcer duration for the healed and unhealed client groups (excluding outliers). Results were not significant (2- tailed test, sig. > .05 level [.510]; df =35).

Regression analysis was also carried out with "healing time" as the dependent variable. While ulcer duration was not related to whether venous ulcers are healed or unhealed, it was a significant predictor of healing time for the healed client group. A linear regression analysis explained that 40% of the variance in healing time, $F(1,24)=16.37$. $p<.005$. A residual plot demonstrates the expected probability for an increased healing time the longer the ulcer duration (Figure 17). No significant results were obtained for other variables as predictors of venous ulcer healing time.

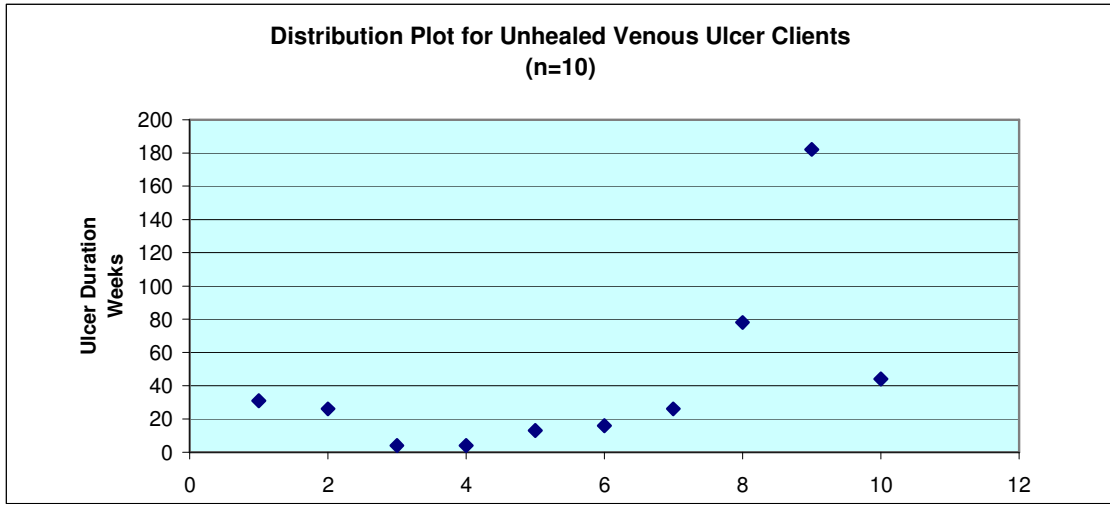
Summary: Ulcer duration prior to clients attending the clinic was found to be the only significant predictor of venous ulcer healing time. However, it was not found to be a significant predictor of whether or not ulcers healed. A larger sample size may impact on these findings.

Figure 17a: Distribution plot for duration of healed venous ulcers (prior to initial visit)



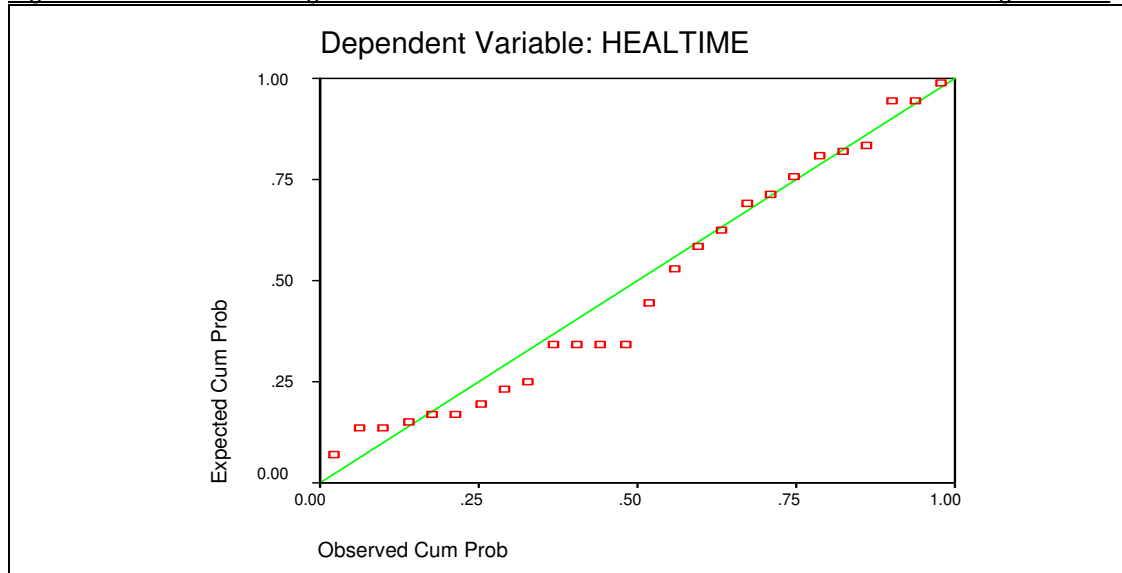
* No outliers for healed ulcers

Figure 17b: Distribution plot for duration of unhealed venous ulcers*



*2 outliers excluded (values 1040 weeks and 1976 weeks) and 2 missing variables

Figure 17c: P-P Plot of Regression Standardised Residuals for Ulcer duration and Healing Time.



5.4 Costing for the Clinic

A comprehensive and accurate cost benefit analysis was not within the scope of the current evaluation and not possible with the existing data set. However estimates of cost effectiveness could be made on the basis of the cost for nurse wages and salaries and goods and services. Other barriers to this analysis were:

- While nursing, nutritionist and administrative salaries could be calculated, data relating to Medicare rebates for medical practitioners working at the clinic was not available.
- The cohort attending the clinic was not comparable to that currently seen in the community. Clients treated at the clinic are predominantly leg ulcer clients whereas community nurses attend to ulcers with varying diagnoses. This has been considered and cost estimations have been made based on the assumption that proportion of venous ulcers seen at the clinic is similar to that seen by community nurses.
- Costs to Community Health used in the following evaluation were based on community nursing figures obtained prior to the clinic's commencement these were modified to include the 2002/2003 nursing salary increase.

Some cost benefit was calculated on the basis of accurate clinic records for pharmaceuticals, dressings and other good used at the clinic, nursing and administrative salaries and figures relating to the cost of community based leg ulcer care (Community Health).

5.4.1 Wages and Salaries.

Estimated salaries and wages for non-medical clinic staff are listed in Table 9. Data for Medicare rebates for General Practitioners was not available. Comparative costs for venous ulcer care in general practice would vary depending on practice charges to clients (Medicare and any GP gap fee), the frequency of client visits and treatment used. Figures relating to ulcer duration (p18) suggest that venous ulcer clients are likely to have seen their General Practitioners for ulcer care on more occasions than they attended the clinic (mean venous ulcer duration prior to clinic attendance 32.3 weeks). It can reasonably be assumed that the cost of medical services is comparable to, or greater than, those incurred at the clinic.

Table 9. Salaries and Wages for Non Medical Health Professionals

	Salaries per Annum	\$	Salaries per Annum	\$
Nursing		360		9000
CNC		160		4000
Administrative		65		1625
	Total	585		14625

Excluding Medicare payments to doctors working at the clinic the above total equates to approximately \$183 per client per annum of which \$162 were nursing salaries for each client attending the clinic (n=80). Based on the estimate of clinic visits for each client category the cost for nursing salaries for venous ulcer clients only (healed and unhealed) was \$9740 per annum \$243 per client.

5.4.2. Cost of Venous Ulcer Care in the Community Health Setting

The Illawarra Leg Ulcer Study (Hoskins et al., 1997) estimated that there were 330 leg ulcer clients in system at any one time with 70% remaining unhealed after 3mths and requiring long term nursing care ranging from 1 to 3 visits per week (equates to 231 persons receiving long term community nursing care for ulcer treatment). Applying these figures to current nursing salaries, the total amount for leg ulcer care per annum could vary between \$414,424 (1 visit per week) and \$1,243,242 (3 visits per week). These figures relate to all categories of leg ulcers and are not specific to venous ulcers. It must be noted that leg ulcer figures from the 1997 study may not equate to figures at the present time. Factors such as recent research on leg ulcer management, projects leading up to the establishment of the clinic (pp 3,4,5) and improved treatments are likely to have impacted on the medical and nursing management of leg ulcers.

The available data does not permit an accurate comparison between the cohort seen at the clinic and those cared for in the community setting as variances exist between client groups, client numbers, ulcer etiology and the interventions. Associated costs would also vary. A rough estimate has been obtained by assuming that the proportion of venous ulcer clients seen by community nurses is comparable to those seen at the clinic (46%). If this were the case, the cost of nursing salaries for venous leg ulcer care would be approximately \$190,635 and \$545,588 per annum.

The major area for cost saving would be in relation to ulcer healing time for both venous and non-venous ulcers (mean healing time for 65% of venous ulcers treated at the clinic was 8.2 weeks [this is unknown for the majority of non-venous but likely to be lessened due to correct diagnosis and appropriate follow-up] compared to 70% of ulcers remaining unhealed in the community after 3mths (Hoskins et al., 1997). The health benefits to clients whose ulcers are healed in a considerably shorter timeframe is also a major consideration.

5.4.2 Other Clinic Related Costs (Based on 2002/2003 prices)

Table 10

Items	Clinic Cost Totals
Office/Clinic Space	Not Known
Hardware	1,277.66
Pharmacy	615.14
Stores	8,146.22
Stationary and Printing	975.05
Non-pharmacy	402.37
	11,416.44

Table 11

Items	Clinic Cost Totals
Goods pa (25 sessions)	11416.44
Salaries	15360
Total per annum	26776.44
Cost per session	1071.056
Cost per leg ulcer per clinic (12)	89.25
Cost per Client per session (10)	97.37

5.4.3 Summary of Quantitative Results

Overall findings from the evaluation were positive and demonstrated the clinic was efficient and effective in managing unresponsive and complicated leg ulcers based on international benchmarks. A total of 80 individual clients were seen by the clinic during the evaluation period. All clients attending the clinic received an accurate ulcer diagnosis. Forty-six percent of these clients were diagnosed with and treated for venous ulcers and outcomes were with 63% of venous ulcers being healed within 8.2 weeks (the international benchmark is 12 weeks).

Table 12:

Illawarra Leg Ulcer Clinic: Evaluation and Outcomes	
Client Profile	Females 55% (n=44), Males = 45% (n=36) Age: Mean=75.36yrs, Median= 77yrs, Range=45yrs to 95yrs Ethnicity could not be determined with available data
Formal Diagnosis Objective: 1) To ensure 100% of clients attending the clinic receive an accurate and prompt ulcer diagnosis.	76 (100% within the allowable time frame) clients attending the leg ulcer clinic formally assessed over 12mths. Ulcer Diagnosis: Venous = 46%, Arterial = 22%, Arteriovenous = 9%, other = 23%. Appropriate referral for all non-venous ulcers and venous ulcers when required. 100% of GPs referring clients to the clinic were provided with prompt diagnostic results and details of the treatment plan.
Venous Leg Ulcers Objective: 2) To meet the international benchmark by reducing healing times for between 12% and 67% in twelve weeks	The duration of venous ulcers prior to referral to the clinic ranged from 4 to 240 weeks, Mean = 32 weeks. Of the 54 venous ulcers 65% were healed within the 12mth study period. Clinic visits range from 1 to 4 per client. 65% of venous clients healed in 8.2 weeks (mean healing time) from the first clinic visit (benchmark 12% to 67% in 12 weeks). The majority of remaining clients, with unhealed venous ulcers, were still undergoing treatment but are still with in the benchmark for healing.
Appropriate Referral Objective 3) To make recommendations for referral to appropriate health professionals for non-venous ulcers and other clients requiring specialist care.	Recommendations for referral to specialist health professionals were made for 80% of the clients with non-venous ulcers (41% of the total sample). All (100%) clients with non-venous ulcers were re-referred to their GPs. Recommendations for clients with venous ulcers to be referred to other health professionals were made as required.
Cost Benefit Objective 4) To reduce health care costs.	It is estimated that health care costs relating to the provision of care in the context of community health and general practice have been substantially reduced due to accurate diagnosis and the reduction in the healing time for venous ulcers. 65% of venous ulcers are healed within 8.2 weeks compared to the 70% (all ulcers) which remained unhealed after 3mths in the community setting.
Client Health and Well Being Objective 5) To improve the general health and wellbeing of clients diagnosed with venous leg ulcers.	An objective assessment of client well-being was not within the scope of this evaluation. However, it is assumed that a reduction in healing time for venous ulcers improved healed clients health and well being by eliminating much of the pain and discomfort and disability associated with venous ulcers.
Sustainability	Commitment from Area Health Service. Costing and rotating roster ensures practitioners are trained and skilled in leg ulcer treatment. Education and feedback to General Practitioners encourages ongoing referrals.

5.4.4 Limitations of the Evaluation (Quantitative)

The current study is the first formal evaluation of the effectiveness of the Illawarra Leg Ulcer Clinic. It stands as a formative evaluation and points to areas for improvement in clinic processes, research design, data collection and analysis.

- The analysis did not include client data relating to quality of life, general health and well-being or client satisfaction. Data on client benefits would be a valuable addition to the analysis and provide a more comprehensive assessment of outcomes.
- Available data did not lend itself to estimating the cost effectiveness of the clinic. To compare clinic costs to community nursing costs, for venous ulcer care, would require comparable data from similar cohorts.
- Limitations of the quantitative analysis resulted mainly from the data base design. The data-base was set up to analyze individual client outcomes and in most cases variables relating to multiple diagnosis and multiple ulcers, for the same client, were not discrete. This meant that considerable manipulation of ulcer data was required and the number of separate ulcers treated at the clinic is likely to be underestimated (p17).
- Inconsistencies/errors in data entry and missing data were also an issue and are mentioned in relevant sections of the report. The timing of data entry for some variables was also an issue (ie. visits to the clinic recorded on healing). Issues with the data-base and data entry are likely to be improved through a review of Area Health Service and Illawarra Division of General Practice reporting and information requirements and an informed review of the data-base.
- Finally, the numbers of clients treated at the clinic during the evaluation period are relatively small and better judgments can be made when larger cohorts have been treated.

5.5 Qualitative Analysis – Results

5.5.1 Overall Views about the Purpose of the Clinic

The primary goal of the clinic was to ensure a systematic approach to the diagnosis and treatment of leg ulcers. This involved correct diagnosis of all clients attending the clinic, evidence based treatment of venous ulcers and appropriate referral of non-venous ulcers. Correct diagnosis was considered the most crucial aspect of the clinic's role as it would enable the underlying factors causing the ulcer to be identified and addressed. Having a specific focus on the client's leg ulcer was also seen to be an advantage in that it is often a secondary issue when seen in the surgery. This is especially the case with long standing ulcers where the client has other chronic conditions that are the primary focus for medical treatment. This was perceived as one of the reasons why clients fell into "a hole" when it came to their leg ulcer care.

It was emphasised that the clinic did not intend to duplicate services by managing clients that were already being successfully treated by General Practitioners and Vascular Surgeons but that it aimed to fill gaps in service delivery by providing care to those who were not receiving appropriate diagnosis and/or treatment and those whose treatment required review.

5.5.2 The Clinic's Approach

The way in which the clinic was described reflected the philosophy underpinning its operation and a positive attitude overall towards the way the clinic operated. A holistic approach to client care was evident. GPs and Community Nurses talked about how client assessment considered underlying conditions and related lifestyle factors as well social and environmental factors that might contribute to the presenting condition. They discussed how appropriate referral to other service providers, for these issues, was part of normal clinic practice.

Clients were referred to other service providers for a variety of reasons including need for education regarding co-morbidities such as diabetes, carer issues and management of home duties (details of referral for medical treatments are outlined in section 3.1). The clinic's approach was considered beneficial to the client for both the physical and psychological aspects of their care. As well as gaining expert care participants were kept informed and involved with the management of their condition. This view was expressed by comments such as the following:

"I feel it is positive for clients. They can see straight away that they're getting expert care. Giving them a positive outlook, given a fortnightly record of healing they know they're in a specialist clinic, very positive for them"

5.5.3 Most Positive Aspects for Staff Working at the Clinic

Given the usual chronic nature of leg ulcers and the lengthy treatment process, nurses working at the clinic said it was satisfying to know that they were adopting best practice guidelines and that they could see improved healing times for clients attending the clinic. General practitioners also considered their participation in the clinic to be satisfying although some raised the issue of continuity of care. Some general practitioners felt that being rotated on a fortnightly basis as opposed to every 3 months, like nursing staff, affected their follow through with individual clients. One GP stated that "GPs only get a snapshot" as they attend the clinic every 12 weeks. However, this was also perceived as an advantage in that they could see *"huge changes in the client's condition from one time to the next."*

There was a general appreciation of working in a specialized context and the view that having two clinical disciplines working together was beneficial for the client. Participants viewed their involvement in the clinic as an “opportunity” for “hands on” learning and an increase in their expertise. Increases in knowledge and skills were attributed mainly to the multidisciplinary approach to client care. The role of the Wound Care Clinical Nurse Consultant, in providing assistance and advice with the clinic processes and updating them on “the latest on ulcer care,” was considered important to the learning environment. Having General Practitioners and Community Nurses elect to work at the clinic was also considered important to the learning environment by those interviewed. One nurse explained this in the following way:

“The thing I really like about the clinic is (that) the doctors are there because they want to be there and they’re happy to teach as well. They’re happy to ask for your input. We’re learning from the doctors and they’re learning from us. The nurses are there because they want to be there.”

Those interviewed considered the model adopted by the clinic to be an improvement on the way unresponsive leg ulcers were managed across services in the past. Areas that were considered to be problematic and/or in need of improvement concerned the clinic’s operational protocols rather than the philosophy or model of care.

5.5.4 Payment/Salaries

General practitioners felt that the Medicare payment system for the provision of clinic services was satisfactory. Their main concern was fee for service to reimburse hours worked and cover surgery costs while they worked at the clinic. Community health nurses were paid their normal salary for hours worked at the clinic. Community Health Nurses raised the issue of the provision of relief staff as it was considered to be problematic on a few occasions and led to an increased workload for those involved (nurses were aware availability of relief staff was an issue).

5.5.5 Areas for Improvement and Suggestions for Change

Comments about how the clinic could be improved varied both within and across disciplines of those interviewed. Analysis of this data proved complex and it was decided to present it in table form with alongside suggestions and considerations that need to be taken into account (Tables 13 to 14). Issues relating to the referral process have also been discussed below.

Table 13: Issues with duration of clinic services

Areas identified for improvement	Reason	Participant suggestions	Considerations
Frequency of Clinics*	Clinic rushed***	Increase to weekly*	Availability of GPs “ “ CHNs “ “ Venue “ “ Transport Associated costs CHN replacement in field.
Hours of Operation*	Clinic rushed*** Work longer than clinic hours every time***	Increase hours of clinic to all day once a fortnight.*	As above Issue with GPs closing surgery for entire day* A benefit for those with long traveling time as insufficient time left for surgery after clinic.
Days of operation	Friday a “hellish” day for clinic to be on!*	A partial home-based assessment of client history. Change to Tuesday or Thursday.*	Suitable for able clients. Would reduce clinic time. Availability of venue determines clinic day.
Scheduling of appointments*	Clinic rushed due to lengthy repeat appointments, require more than the ½ hour allocated.*	Schedule longer repeat appointments for multiple or complicate ulcers.	Difficult to pre-estimate appointment time required.
Equipment storage*	Setting up/packing away time consuming as equipment stored away from clinic* Setting up means nurses work extra hours.	Increase clinic hours to accommodate. Storage facilities to be located in clinic venue.* Change of venue.	Availability of space. Other services to share clinic space so as to fully utilize resources.

* Identified by more than one participant ***Identified by the majority of participants

Table 14: Clinic Process and Protocols

Areas identified for improvement	Reason	Participant suggestions	Considerations
Referral Forms	Incomplete client information***	Regular GP updates re clinic processes and protocols.*	Resources/time required to organize update.
		Check 1 week before and contact GP if referral information not complete.	Job allocation.
Assessment forms	Format of forms "a bit messy"*	Review of assessment forms	Resources in redesigning forms.
	If multiple ulcers some forms duplicated. Results in clinic running behind schedule*		Limited scope in redesigning given information required.
Client notes	Confusion in some areas eg. occasions of service.	Standardize notes so each occasion of service is separate. This would also facilitate data entry.	Flexibility of data requirements
Rostering of staff	Difficulty familiarizing with new treatment approach and clinic processes*	New staff should be observers for first clinic session.	Relief costs.
Clinic Breaks	Clinic rushed no time for tea break.	Review clinic schedule to allow for break.	Change in schedule may affect GP payments.
	Work stress.	Clients complete partial assessment prior to first clinic visit.	Suitable for some clients. Would reduce clinic time (also in Table 13).

* Identified by more than one participant ***Identified by the majority of participants

5.5.6 Referral Processes

Referral processes have been streamlined and are accepted at a central intake point (Rehabilitation Services reception at Port Kembla Hospital). Referrals are accepted from any health care professional however the client's medical practitioner is required to provide client details outlined in the referral form (Appendix 3a).

Incomplete referral information was a major issue raised during interviews. Lack of relevant client details such as wound history and previous investigations meant this information had to be "chased up" with considerable loss of administrative, clinic and client time. There was also a perception that there was reluctance by some General Practitioners to refer to the clinic. It was suggested that further promotion of the clinic and ongoing education might assist in the implementation of a standardized approach across the area.

Aside from the issues outlined above those working at the clinic felt that the referral protocols (appendix 3a and 5a) worked well and were time efficient, with appointment and follow-up visits being arranged by reception at Rehabilitation Outpatients' Services. Clients are requested to bring the necessary documentation, a list of current medications and copies of recent pathology results. Interpreter and transport, arranged by the hospital, is made available to facilitate access to the clinic and general compliance.

5.5.7 Further Issues for Consideration

- A number of participants expressed concern that the number of General Practitioners referring to the clinic was relatively small. It was suggested that the clinic's role be promoted on an ongoing basis to encourage referral by general practitioners.
- Issues relating to client follow-up were also raised. Some general practitioners do not provide feedback as to whether recommendations for referral were adopted.

6. Conclusions of the Evaluation Overall

The outcomes for clients attending the clinic have been positive and have demonstrated the benefits of the intervention provided by the Illawarra Leg Ulcer Clinic.

1. From available data it appears that the ILUC meets or exceeds international benchmarks for performance (Scottish Intercollegiate Network, 1998). This is based on 12 months data and 40 venous ulcer clients and so needs to be monitored on a longer timescale.
2. Interviews with GPs and community nurses working at the clinic showed a high level of support for the clinic, its processes and outcomes suggesting that this is a worthwhile and sustainable model of service delivery.
3. Economic data suggest that this is likely to be a cost effective way of dealing with a condition that is amenable to treatment but requires accurate diagnosis and evidence based intervention if it is to be reversed.
4. The available data suggests that the duration of the venous ulcer prior to attending the clinic is a significant predictor of healing time. This suggests that early referral of venous ulcers to the clinic will improve outcomes.
5. This model of cooperation between community nurses and GPs is regarded by both parties as valuable, in terms of the learning opportunities it provides through the rotation of GPs and community nurses.
6. The success of the clinic is due to the joint planning, management, operation and governance arrangements put in place by Community Health and IDGP.
7. The evaluation has identified a range of possible improvements to the clinic and its operations. These follow in section 7 "Recommendation".

7. Recommendations

1. While the evaluation is positive in its findings a larger cohort of clients need to be studied and the non-venous ulcer clients should also be traced.
2. Referrals for specialist care are made by GPs on the recommendation of the clinic. The management committee should consider whether GPs follow the recommendations of the clinic perhaps through developing a feedback process from the client's GP.
3. Some minor amendments need to be made to the data collection, database design and entry processes to reflect the clinical and service processes more comprehensively that and to facilitate monitoring and evaluation of outcomes.
4. Under the current resourcing model the impact of the clinic is limited to the number of clients who can be seen in one fortnightly session. Since the key elements of the process are accurate/timely diagnosis and evidence based treatment, the management committee should consider the following options:
 - a. expanding clinic hours
 - b. focusing the clinic on diagnosis, determining and securing the most appropriate treatment (which may be provided by generalist community nurses, practice nurses or GPs), and ensuring adherence to guidelines
 - c. treating more complex ulcers and organizing treatment of some ulcers in the community
 - d. and expanding the education and training role of the clinic so that options b. and c. are viable
5. The management committee should explore the possibility of making an accurate ulcer diagnosis (or referral for same) as part of the essential criteria for referring ulcer clients to Community Health Nurses. The available evidence suggests that this would improve outcomes for clients treated in the community health setting.
6. GPs who worked at the clinic felt that there would be value in rotating medical interns through the clinic so that they were better prepared for clinical practice in the community.
7. Under current service arrangements, community nurses see a large proportion of clients with leg ulcers in the community who are not referred to the clinic. It follows that it would benefit nurses and clients if community nurses were able to spend some time at the clinic to reinforce their skills.
8. A repeat of the Hoskins et al. leg ulcer study would enable accurate trend analysis with current data. This is a pre-requisite for analysis of costs and hence efficiency of the service.

The management committee has acted on the finding that the duration of the ulcer is a predictor of healing time. The GP referral form has excluded the criteria that ulcers need to be of at least 4 weeks duration.

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APPENDIX 1

Table 1: Initiatives Targeted to Address Leg Ulcer Management in the Illawarra (Background)

Initiative	Partnerships	Aims	Method and Results	Outcomes
<p>Illawarra Community Health Northern Region Wound Management Survey (Steele et al., 1993, Unpublished Report, IAHS.)</p> <p>→</p> <p>↓</p>	<p>Community Health Nurses (Specialist Generalist and Enrolled Nurses)</p>	<p>To identify resources utilized in the management of wounds in Community Health (northern region).</p>	<p>Nurse completed survey (N=12)</p> <p>Time frame = 30 days Client Sample (n=120) Occasions of service = 766</p> <p>Wound Categories = 7 Leg Ulcers > 54% of total costing 42% of total clients 48% of total occasions service for wound care</p>	<p>Obtained costing for home-based treatment of various wound types.</p> <p>Identified community based leg ulcer management as target for quality improvement. Recommendation:</p> <ul style="list-style-type: none"> • Further research • Investigate strategies for improved management of leg ulcers in the community setting.
<p>Illawarra Leg Ulcer Study (Hoskins,A.Ramstadius, B., Sibbald, 1997,Primary Intention, 5(3) , pp24-30.</p> <p>→</p> <p>↓</p>	<p>University of Wollongong Project</p> <p>Partners: Illawarra Area Health Service Aged Care Sector Private Hospitals</p>	<p>Determine point prevalence, aetiology and management of chronic leg ulcers in the Illawarra and Shoalhaven</p>	<p>Quantitative Descriptive Study Survey Questionnaire</p> <p>Time Frame = 3mths Sample (n= 330) leg ulcer clients</p> <p>Point Prevalence = 0.10% in total population of 43,564 Point Prevalence = 0.63% >65yrs No formal diagnosis = 52% of clients Unhealed after 3 months = 70% Different products used = 44 Appropriate pressure bandaging for venous ulcers = 34% of identified venous ulcers.</p>	<p>Extent of problem and related issues identified. Recommendations:</p> <ul style="list-style-type: none"> • Establishment of leg ulcer clinic with specialist input. • Development of guidelines for use by general practitioners when referring to community. • Develop specific educational strategies for health care professionals re Leg ulcer care • Improve client access to graduated compression bandages.
<p>Establishment of Area Wound Care Working Party</p> <p>→</p> <p>Review and Development of Area Health Wound Care Policy and Guidelines Incorporating Leg Ulcer Care (Ramstadius, B. 2002, IAHS Publication)</p>	<p>Community Health Services</p> <p>In Consultation With Wound Care CNC General Practitioners Vascular Surgeons</p> <p>Medical Specialists Consultants in Wound Care</p>	<p>Develop policy and guidelines for the provision of high quality nursing care for leg ulcer clients in the community.</p> <p>Explore avenues for improved quality and continuity of care between general practice and community health for the target group.</p>	<p>Research into Best Practice Models</p> <p>Consultative process: Considered Diagnosis Referral Treatment and Management</p> <p>Review of Existing Area Policy Incorporation of current research based Best Practice Guidelines</p>	<p>Community Health Policy Developed and Implemented Includes: Nursing Guidelines Educational resources for Clients/Carers Client Contracts</p> <p>Wound Care Kit (Practitioner Resource) Includes: Wound Care Management Policy and Guidelines Wound care Assessment Chart Relevant Research Papers</p>

APPENDIX 2

Northern Sector Generalist Community Health Wound Management Survey Summary (Steele et al., 1993)

Table 2: Summary of Findings (Survey conducted over the 31 days in October, 1993)

	WOUND CLASSIFICATION						
	Burns	Pilonoidal Sinus	Post-operative (uncomplicated)	Post-operative (complicated)	Simple Wound	Leg Ulcer	Pressure Sore
Cost of dressing material	\$61.31	\$51.20	\$150.62	\$950.47	\$79.35	\$1,719.50	\$145.22
No. of Clients	2	3	19	26	12	50	8
No of Visits	28	37	79	188	29	364	41
Average Number of Visits	14	12	4	4	2	7	5
Cost per Visits	\$2.19	\$1.38	\$1.91	\$5.05	\$2.74	\$4.72	\$3.5

* Figures obtained from secondary source (IAHS Community Health Wound Care Committee, 1998, "Wound Care Kit".

Total cost of dressing supplies for October 1993	\$3, 157.67
Total number of clients seen for wound dressings, October 1993	120
Total number of visits for wound dressings, October 1993	766
Average number of visits per wound care clients, October 1993	6