A report on the effectiveness of comprehensive wound assessment and documentation in the community

Carville K • Smith J

Abstract

The most important practical lesson that can be given to nurses is to teach them how to observe (assess) – how to observe (assess) what symptoms indicate improvement – what the reverse – which are of importance – which are evidence of neglect, and what kind of neglect – Florence Nightingale, 1859 [1].

This paper highlights the wisdom expressed here by Miss Nightingale in regard to the care of aged wounded war veterans in the domiciliary setting. Silver Chain Nursing Association is the largest provider of home care in Western Australia. In 2000 a wound survey was carried out on all Department of Veterans' Affairs (DVA) clients who were receiving wound management from Silver Chain. The aim of the survey was to review the prevalence, type and source of wounds on DVA clients referred, and to evaluate the nursing assessment and resources used to manage their wounds. A process was also established to review the times and costs involved in healing these wounds. In addition, when the findings of this study were compared with the findings of a wound prevalence survey that was conducted in 1996 amongst all Silver Chain clients who received nursing care, it was found that clients in the DVA study were 30% more likely to heal than those all-aged clients in the 1996 study. The significant reduction in healing rates and associated reduction in costs of wound healing were thought to be achieved when comprehensive nursing assessment and documentation were employed in the management of clients with wounds in the community.

Carville K & Smith J. A report on the effectiveness of comprehensive wound assessment and documentation in the community. Primary Intention 2004; 12(1); 41-44, 46-48.

Keryln Carville*
A/Professor Domiciliary Nursing
Curtin University

Silver Chain
6 Sundercombe Street, Osborne Park WA 6017
Tel: (08) 9201 6722
Fax: (08) 9242 0268

Joanna Smith
Senior Research Officer
Silver Chain
6 Sundercombe Street, Osborne Park WA 6017

*Correspondence to Keryln Carville

Introduction

A wound survey was carried out on all Department of Veterans' Affairs (DVA) clients who were receiving wound management from Silver Chain Community Care services over a dedicated week between November 1999 to April 2000.

The initial aim of the survey was to identify the number of veterans referred to the community care services of Silver Chain for wound management and provide information on the types and causes of their wounds and statistics related to assessment and management of their wounds. Secondly, it was the aim to observe the effects of introducing a comprehensive wound assessment and documentation protocol. Thirdly, it was the aim to implement a process for ascertaining the time taken and costs accrued to heal the wounds on the veterans. The databases that were established as a result of this study

and a previous wound prevalence survey undertaken across all domiciliary services of Silver Chain in 1996-1997 [2] allowed comparisons to be made between the time taken and costs accrued in healing the wounds of non-DVA and DVA clients.

Aim of the study

To review the prevalence, type and source of wounds on DVA clients referred to Silver Chain, to evaluate the nursing assessment and wound management protocols used to care for these veterans and to identify the time and costs to wound healing.

Methodology

Study design

A wound survey was conducted including an audit of the Silver Chain nursing documentation and a review of all wounds on every community care DVA client in the metropolitan, rural and remote centres during the period 11 November 1999 to 27 March 2000. Veterans receiving hospice services in the metropolitan area were not included in this survey.

Data collection

The survey instrument developed and used for a wound prevalence survey that was conducted in 1996 was evaluated with the objectives of the DVA survey in mind. Alterations were made to the instrument in order to meet the study objectives but, at the same time, allow comparisons to be made with the 1996 survey findings.

Silver Chain advanced community nurses (ACNs) employed in the metropolitan bases and a number of experienced clinical nurses employed in the major regional centres were selected to conduct a review of all DVA clients who had a current wound care plan during the survey period. These nurses were informed of the aims, objectives and processes for audit and review of all veterans.

Prior to the survey, nurses selected to participate in the study undertook a comprehensive educational update on wound assessment and management, which included assessment of the lower leg and neuro-ischaemic foot. The assessing nurses had received comprehensive education on clinical assessment of the lower leg and were deemed competent in the use of hand-held Doppler ultrasound, a Semmes-Weinstein (5.07mm or 10gram) monofilament and a tendon hammer.

All veterans who demonstrated previously undiagnosed signs of impaired vascular status, neuropathy, foot or gait deformities were referred back to the general practitioner for further medical assessment and management. A referral to a podiatrist or orthotist for off-loading of plantar pressures was sought for veterans with foot ulceration. Podiatry services were sought for veterans who required debridement of hyperkeratosis or callus formation. Similarly, if assessment identified other factors known or suspected to inhibit wound healing in veterans, then they too were referred for ongoing medical intervention.

A decision was made to have the nurses conduct the survey as a team and for them to complete the survey one service centre at a time. At the time of survey, there were 21 Silver Chain service centres situated across the Perth metropolitan area and a wide rural area of Western Australia. A survey week was selected for each centre and all veterans with a current wound care plan from each centre were surveyed during that week.

An initial audit was conducted of all DVA clients' documentation and, following the audit, each veteran with a wound had a comprehensive wound assessment performed by the surveying nurse. A post-assessment audit of the documentation was then conducted. In cases where the veteran had more than one wound, a separate survey form was completed for each wound.

A second instrument was designed to record the date of healing or discharge from the service for each wound. This was left in the veteran's notes, along with instructions for its return to the research department on discharge of the veteran from that episode of wound care. This instrument was identified by a unit record number and a survey number that corresponded to the primary survey instrument for each wound recorded.

Data analysis

Survey data were entered by an external service specialising in data entry. The analysis of data was conducted by Silver Chain using the SPSS statistical package.

Survey findings

The wound survey identified that 31.5% of all DVA clients referred to Silver Chain had wounds. The types of wounds are detailed in Figures 1&2. There were 155 veterans who had 222 wounds in total during the survey period. Metropolitan bases were found to be caring for 170 of these wounds and rural and remote bases cared for 49 of the wounds. There were three wounds not able to be allocated to a specific service due to coding faults on the survey instruments. Note that the percentages, as presented, may not total 100% in all instances because of rounding of results.

Prevalence, type and source of wounds

Leg ulcers

Leg ulcers constituted 47% of all wounds referred and the underlying vascular aetiology of this population was found to be venous [36% (n=38)], mixed arterial/venous [35% (n=37)], arterial [18% (n=19)] and unclassified ulcers [5% (n=12)].

Age and gender

The majority of veterans were aged 70 years or older. As could be anticipated in a veteran population, there was a predominance of males (n=142) to females (n=78) (Table 1).

Reason for referral

The wound was the primary reason for referral in 63.1% (n=140) of responses and not the primary reason for referral in 36.5% (n=81) of responses. One veteran was unsure of the reason for the initial referral to Silver Chain.

Source of referral

The sources of referrals were found to be in keeping with those anticipated in an elderly veteran population. The predominant source of referrals came from general practitioners [40.5% (n=90)]. The second highest number [26.6% (n=59)] came from the hospital contracted to provide veterans' services. The remainder of referrals came from other hospitals, specialists or other Silver Chain services.

Cause of wounds

The predominate cause of wounding [45.9% (n=102)] was found to be trauma. Surgery resulted in 15.3% (n=34) of the wounds and the remainder were stated to be caused by pressure, shearing, malignancy or 'other' causes. In 18.5% of the cases, it was not possible to identify a specific cause of wounding.

Diabetic status

Amongst the 155 veterans with 222 wounds, there were 17.6% (n=39) wounds on diabetic clients. All the known or suspected diabetic veterans were assessed for signs or symptoms of compromised vascular status and peripheral and autonomic neuropathy using the Silver Chain foot screen tool.

Nursing assesment and wound management

Assesment

Data were collected in regard to general wound assessment and assessment parameters specifically relevant to veterans with lower leg ulcers. The length of time from the last documented wound assessment to the survey was noted. In 35.3% of veterans' notes there had been a documented wound

Figure 1. Types of wounds.

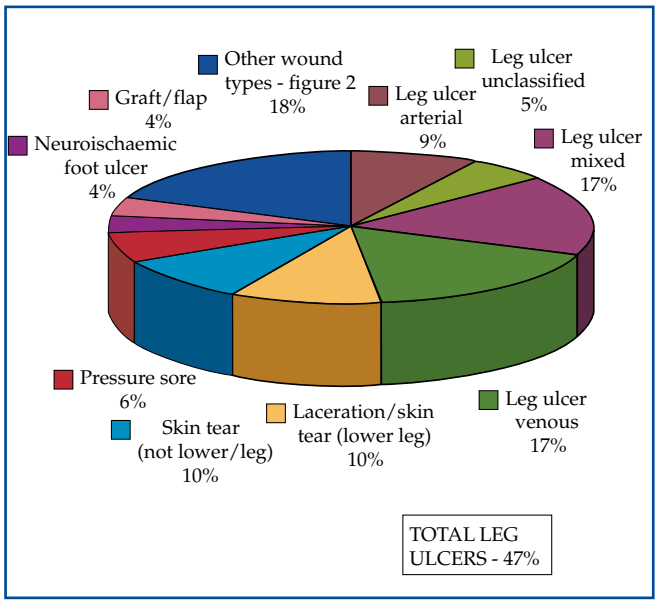


Figure 2. Types of wounds.

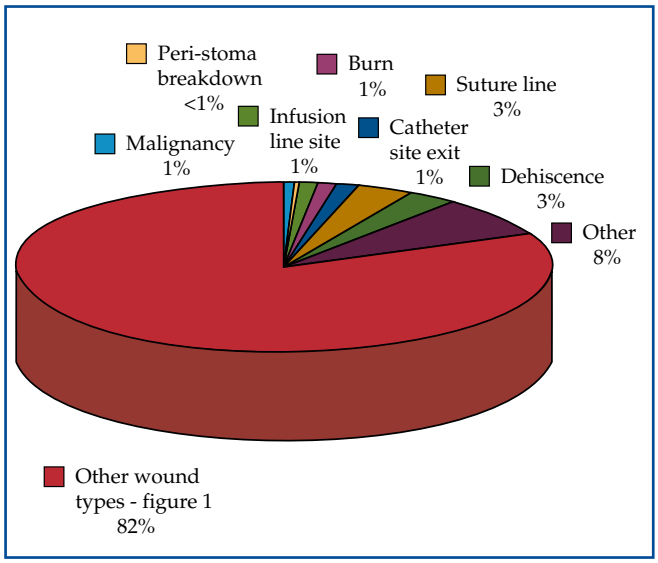


Table 1. Number of wounds.

Age	Number of wounds
40-49 years	1
50-59 years	1
60-69 years	9
70-79 years	71
80 years +	134
Unrecorded age	8

assessment within the week prior to survey, 35.7% within the month and 13.8% longer than a month. However, 15.1% were not found to have a comprehensive documented wound assessment prior to the survey.

Documented evidence related to assessment parameters of wound location, wound measurements, clinical description of the wound, description of the surrounding skin, pain, nutritional status and medications were surveyed in the client's file. In addition, the documentation of veterans with lower leg ulcers was surveyed for evidence of hand-held Doppler ultrasound assessment for Ankle/Brachial Pressure Index (ABPI) and palpation of pedal pulses.

In keeping with the purpose of the survey (firstly, to audit the documentation in regard to assessment and, secondly, to ensure that a comprehensive assessment was performed and documented for all clients), evidence of a pre-audit and post-assessment was sought. Figures 3 & 4 highlight the wound assessment parameters found to be recorded both pre-audit and post-assessment.

The post-assessment evidence of documented parameters of assessment ranged from 98.2-99.1%. There were eight veterans who did not obtain a perfect score on all parameters; they were followed up to ascertain specific reasons for not achieving a perfect score in regards to documented assessment. It was found that four of these eight veterans had since healed and three of them had been discharged. The remaining veteran had ongoing nursing and personal care needs not related to that wound episode. It was found that two veterans had catheter exit sites (nephrostomy and renal dialysis). It was deemed not reasonable to expect that these very small catheter sites would be able to be measured aseptically or accurately for diameter of the exit site and a good description of the surrounding skin was provided in both incidences.

It was found that a veteran who had not had an ABPI recorded at time of review had multiple lesions on his lower legs, which were in fact due to the surgical removal of basal cell carcinomas and not vascular ulcers. However, when his documentation was re-audited, it was found that an ABPI had been recorded at a later date.

Another veteran had been surveyed and assessed on a weekend and the ACN who performed the assessment did not have a Doppler at hand. Although a request had been made to complete this assessment on the Monday, the survey

Figure 3. Wound assessment parameters recorded in the home notes.

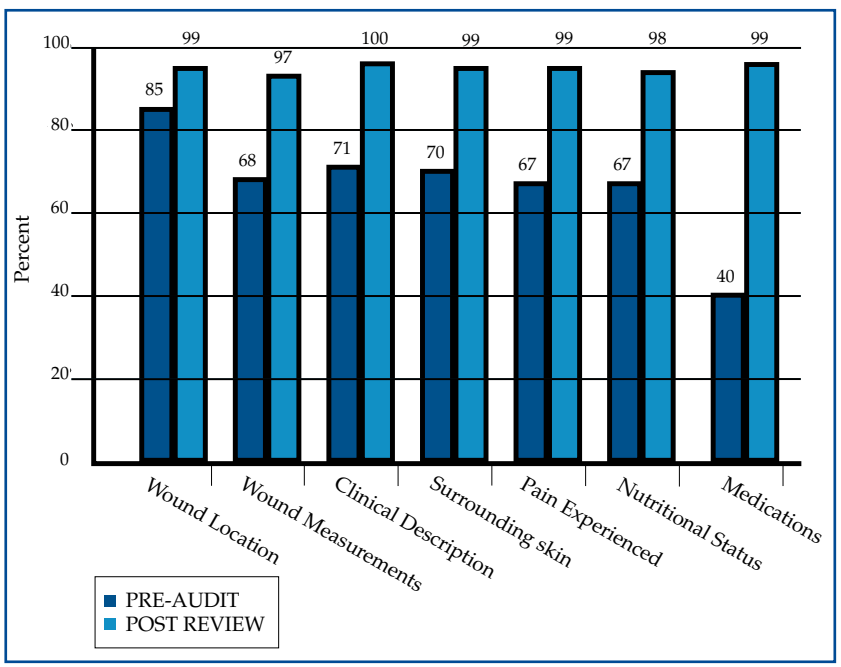
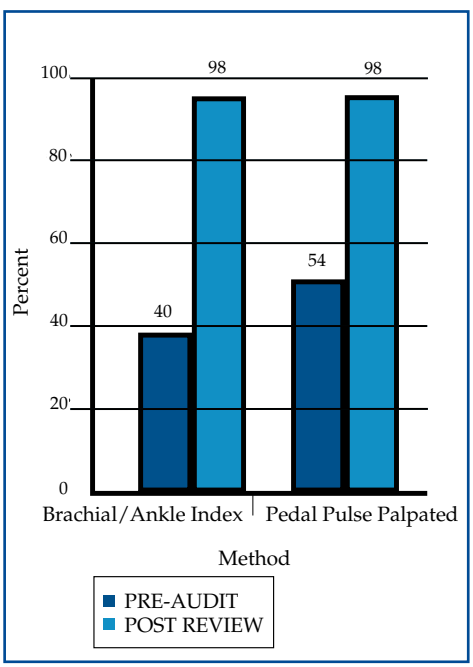


Figure 4. Leg ulcer assessment parameters recorded in the home notes.



instrument was returned to the research department with this assessment parameter not documented. When the veteran's documentation was re-audited, evidence of a documented ABPI was evident. In summary, it could be determined that all veterans did in fact, receive a comprehensive assessment.

Wound infection

There were 6.3% (n=14) of wounds described as being clinically infected at the time of survey. Data were collected on the presence of clinical signs or symptoms that could be indicative of infection such as erythema, heat, swelling, pain and the presence of purulent exudate. There was evidence of a pathology report following a wound swab for seven wounds, although the surveyors had attempted to contact all medical practitioners who had prescribed antibiotic therapy for the treatment of 22 of the wounds. Current signs and symptoms of clinical infection were found to exist in 12 of the wounds, which had been prescribed current antibiotic therapy.

Wound management

Aspects of wound management that were surveyed included the use of wound cleaning solutions, primary and secondary dressings used, use of antimicrobial agents, use of lower leg compression therapy in the treatment of venous leg ulcers and the frequency of dressing changes.

Where data were available, it was ascertained that the following wound cleaning solutions, primary and secondary dressings were requested by referral sources and were compared to those found to be used at time of survey.

Wound cleansing solutions

At referral, 57.4% (n=124) of veterans had been referred with no specific instructions for wound cleansing solutions and, in 34.7% (n=75) of cases, normal saline 0.9% solution had been requested. Only 1.9% requests were received for water as the cleansing solution and, in 2.8% (n=3) of cases, antiseptic solutions were requested. At time of survey, 67.0% (n=148) of veterans had their wounds cleansed with normal saline 0.9% solution, 27.1% (n=60) used water and, in 1.8% (n=4) of cases, antiseptic solutions were used. In all other instances, no specific solution was found to be used.

Primary wound dressings

At time of referral, 53.0% (n=115) of veterans had no specific request for primary dressings. Of the requests, 8.3% (n=18) were for dry or low adherent dry dressings, 5.5% for (n=12) antiseptic dressings, 1.8% for (n=4) saline impregnated wick dressings and the remainder were requests for a variety of modern dressings such as foams, hydrocolloids, calcium alginate, hydrogels etc. At the time of survey, it was found that 10.9% (n=24) had dry or low adherent dry dressings, 9.5% (n=21) had antiseptic dressings, 0.5% had (n=1) saline impregnated wicks and the remainder had a wide assortment of modern dressings applied. Ten per cent (n=22) of the venous leg ulcers were treated with zinc paste bandages.

Secondary dressings

Secondary dressings, which are normally used for additional absorption of exudate, protection or dressing retention, were not required in all instances. Data were collected in regard to secondary and tertiary dressings used. At referral, it was found that 31.1% (n=52) of the wounds did not require a secondary dressing, which compared to 25.4% (n=52) of secondary dressings used at the time of survey. The remainder of requests at referral for secondary dressings ranged from dry dressings, foams, semi-permeable films and retention bandages. A similar comparison could be made with secondary dressings used at time of survey.

Compression therapy for venous leg ulcers

It is generally agreed that graduated lower leg compression therapy of 30-40mmHg is the gold standard for the management of venous leg ulcers [3, 4]. There were 38 venous leg ulcers identified amongst the veterans. Recommended ranges of compression therapy can be obtained with the use of compression bandages or compression surgical stockings. At referral, only 5.3% (n=3) of clients with venous ulceration had been prescribed appropriate compression bandages or stockings, which meant 81.6% (n=31) of the venous leg ulcers had no compression therapy prescribed and 7.9% had inadequate compression prescribed for the treatment of venous ulceration.

At the time of survey, it was noted that 60.6% (n=23) of the venous leg ulcers received appropriate compression therapy, and 26.4% (n=10) had bandages or stockings that delivered less than the desired 30-40mmHg at the ankle, whilst there remained 13.2% (n=5) clients with venous ulceration who had not received, or refused to have, compression bandages or stockings. The use of pneumatic compression devices for this latter group of veterans was explored (Figure 5).

Frequency of visits for wound care

The majority of the wounds referred had no frequency of visits for dressing changes requested and, amongst those that did, there was a high number of requests for daily dressings [29.5% (n=64)]. When these statistics were compared to frequency of dressing change at time of survey, there was a reduction in daily dressings [21.8% (n=39)]. The majority of

dressings were changed three times a week [33.2% (n=60)], twice a week [37.8% (n=68)] or less often.

Duration of wounds

The length of time that Silver Chain had been managing each wound was calculated from the time of the initial visit to the date of the survey. At time of survey, there were 38% (n=84) of wounds that had been managed for less than 1 month and 8.6% of wounds had been managed for periods longer than 1 year. Leg ulcers constituted eight of the 11 wounds that received care for 1-3 years and all of the eight wounds that had received care for longer than 3 years.

Time and costs to wound healing

Times

One of the objectives of the wound survey was to set in place a mechanism for evaluation of wound healing times and identify the costs of wound healing. At time of survey, a separate instrument was coded for each wound episode and placed in the veteran's home notes with instructions to return to the research department on completion of healing or discharge from that episode of wound management.

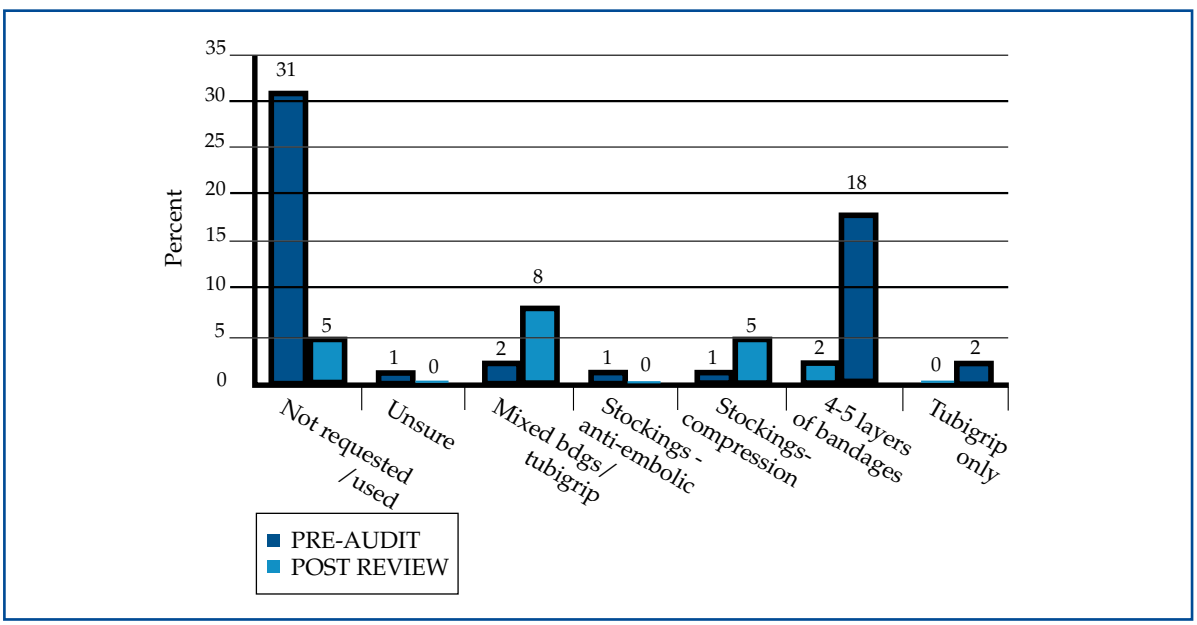
Time to healing was calculated from the first visit for each episode of wound management to discharge from that episode. On audit at 1 year post-survey, it was found that of the 222 of the veterans' wounds [87% (n=168)] had healed and 13% (n=25) had continued to receive ongoing wound care. There was a higher number of unhealed leg ulcers (n=19) when compared to other unhealed wound types. Twenty nine veterans were found to have been discharged or deceased. The mean time to healing was 170 days, with a minimum of 3 days and a maximum of 1702 days.

A veteran with a neuro-ischaemic foot ulcer who had had his ulcer for 555 days healed 50 days following the survey and comprehensive assessment and appropriate referral for off-loading of plantar pressures. Another veteran with two leg ulcers of mixed aetiology had had these leg ulcers for 1616 days at time of survey. Following a comprehensive assessment and the implementation of appropriate management, one leg ulcer healed in 86 days; however, the other leg ulcer healed 1666 days after survey. There were a higher number of unhealed wounds found to exist in the population aged over 80 years (n=15).

Cost of wound healing

A cost analysis was conducted on the 87% (n=168) of healed veterans' wounds at 1 year post-survey in 2001. Analysis took into account the costs of consumables (dressings, packs, solutions and bandages) identified at survey, the nursing time taken to perform the procedures, the frequency of wound

Figure 5. Type of lower leg compression requested and used for venous leg ulcers.



management visits and the numbers of days to healing. Travel time for nurses and administration costs were not included in the cost analysis. Time taken to perform the wound management was obtained from direct care tracking records. If a client had more than one wound, then direct care tracking time was divided by the number of wounds for each client.

Overall, it was found that pressure ulcers were the most costly wounds to heal, followed by leg ulcers and acute wounds respectively. However, there were great variances noted in the costs of individual wound types, subject to the length of episode of care.

Caparisons between the 2000 and 1996 survey findings

Comparison of wound types identified in the 2000 survey were compared to the 1996 wound prevalence survey conducted by Silver Chain. Although there was a total of 1699 wounds in the 1996 survey, there was an aligned relationship for most wound types, especially leg ulcers (Table 2).

Table 2. Caparisons between the 2000 and 1996 survey findings.

DVA 2000			1996
47%	(n=106)	Leg ulcers	48%
10%	(n=22)	Lacerations/skin tears to lower legs	not analysed individually
9.5%	(n=21)	Lacerations/skin tears not lower legs	5.5%
7.7%	(n=17)	Other types of wounds	14.5%
6.3%	(n=14)	Pressure ulcers	8%
4.1%	(n=9)	Skin grafts/flaps	3%
3.6%	(n=8)	Neuro-ischaemic foot ulcers	not analysed individually
3.2%	(n=7)	Dehiscence	6%
3.2%	(n=7)	Suture lines	5%
1.4%	(n=3)	Burns	2%
1.4%	(n=3)	Catheter exist sites	1%
0.9%	(n=2)	Infusion line site	not analysed individually
0.5%	(n=1)	Malignancy	3%
0.5%	(n=1)	Peri-stoma breakdown	0.2%

There were also similarities to be found between the cleansing solutions and dressings used to manage the wounds in both populations. Comparisons were also made between the healing rates of the 1996 wound prevalence survey at 1 year post-audit in 1997 and the DVA 2000 survey healing rates in 2001. The 1996 study demonstrated a healing rate of 68% of wounds in all aged clients compared to the 2000 healing rate of 87% in a population which was predominately over 80 years of age.

A Cox Regression analysis was conducted on all variables between the 2000 and 1996 surveys and it was found that the veterans in the DVA 2000 study were 30% more likely to heal at 1 year post-audit than all-aged clients in the 1996 study. The 1996 survey was conducted as an audit of documentation and the clients did not receive an independent ACN wound assessment.

Discussion

Individualised client assessment has been described as a key component to effective wound management [5]. Comprehensive wound assessment assists the nurse to establish the goal of care, determine the frequency of reassessment, and project the healing trajectory [6]. The effectiveness of these clinical assessments and associated decisions made are reduced if the findings of the assessment are not well recorded [7] or collaboration with other health professionals is not a priority. This was certainly found to be the situation in this study and is demonstrated by the improved healing rates overall when compared to the 1996 survey. In particular, it highlights the advantages to the veterans described above who had very hign number of chronic leg and foot ulcers and who demonstrated significant healing times following comprehensive assessment and following collaborative interventions.

It was of particular interest to note that leg ulcers continued to constitute almost 50% of all wounds found in the two community surveys. It was also encouraging to note a significant improvement in diagnosis of underlying vascular aetiologies in the veteran leg ulcer population when compared to the 1996 study. In the 1996 study it was noted that 71.5% of leg ulcers had been referred with no specific diagnosis or classification of ulcer type other than 'leg ulcer'. In the 2000 study this compared to 5% of unclassified leg ulcers. This improvement could be considered indicative of an increased availability of hand-held Doppler ultrasounds and

comprehensive education of nurses within the organisation.

Trauma was identified to be the predominate cause of wounding in the aged veterans; this could be perceived to relate to the high numbers of lacerations/skin tears [19.5% (n=43)] and leg ulcers [47.9% (n=104)]. Many leg ulcers, although compromised by underlying vascular aetiology, are initially caused by skin trauma in the frail elderly.

The use of antimicrobial agents was not deemed to be excessive considering the number of wounds described to be clinically infected. It is important to note that in Western Australia both systemic and topical antibiotic therapy does require a medical review and prescription, as does the ordering of any pathology investigation. One of the difficulties experienced by domiciliary nurses is the access to relevant information from pathology reports sent to medical practitioners in private practice or hospitals. This also highlights the need for good collaboration amongst health professionals.

A comprehensive assessment of each individual, their wound, and their healing environment is a prerequisite for appropriate wound management and optimal clinical outcomes. The survey identified appropriate use of wound cleansing solutions and primary and secondary dressings. It was a concern that there were so few requests at referral for lower leg compression therapy in veterans identified to have venous leg ulcers. However, the use of appropriate or modified compression therapy in the treatment of venous leg ulcers was demonstrated in most instances at the time of survey. Alternative pneumatic compression therapy was explored for those veterans who were unable to tolerate compression bandages or stockings.

Considering the diversity of wound types and the majority of treatment decisions that were identified to be afforded domiciliary nurses, the survey emphasises the need to support their decisions with ongoing education in the assessment and management of wounds and the need for comprehensive documentation. At the time of the survey, the standard of wound documentation was found not to be consistent. It was excellent in some situations and less so in others. Since the survey, considerable effort and enterprise has been directed towards the ongoing review of clinical documentation. Assessment forms, care plans and guidelines have been devised to cue assessment and direct management options. The study highlighted the fact that such documentation is fundamental for optimising clinical outcomes and providing evidence of care delivery. In addition, access to an extensive range of all generic categories of modern wound dressings, diagnostic equipment and access to clinical nurse consultants has ultimately proved to be a cost-effective venture.

Summary

The 2000 wound survey provided valuable data, which allowed Silver Chain to meet its study objectives and afforded the association an opportunity to compare past and future study findings in regard to the management of all clients with wounds.

Above all, this study provided the evidence that comprehensive assessment of wounded clients reduces the overall times and costs to healing, although comprehensive assessment is recognised to incur additional costs in the short term. In addition, the 2000-2001 and the 1996-1997 surveys provided evidence that wounded clients over the age of 80 years take longer to heal and, thus, consume more resources in the process. This is especially the situation with aged clients with leg ulceration. In light of the statistics available on Australia's ageing population, it would appear that this is relevant information for projected health budgeting.

References

1. Baly M. As Miss Nightingale Said… (2nd ed). London: Bailliere Tindale, 1997.
2. Carville K & Lewin G. Caring in the community. Primary Intention 1998; **6(2)**:54-62.
3. Moffatt C. Venous leg ulceration: treatment by high compression bandaging. Ostomy/Wound Management 1995; **41(4)**:16-25.
4. Thomas S. The science of compression bandaging. London, Emap Healthcare 1998; 1-13 supplement.
5. Nelson DB & Dilloway MA. Principles, products and practical aspects of wound care. Critical Care Nursing Quarterly 2002; **25(1)**:33-54.
6. van Rijswijk L. Wound assessment and documentation. In: Krasner D & Kane D. Chronic Wound Care (2nd ed). Wayne, PA: Health Management Publications, Inc 1997; p.16-28.
7. Foster L & More P. Acute surgical wound care 4: the importance of documentation. British Journal of Nursing 1999; **8(5)**:288-92.