Interdisciplinary chronic-wound care services involving podiatry – a strengthened model of care?

Butters T

Abstract

Objective: The objective of this study was to determine preliminary outcomes for clients attending a chronic wound service with podiatry involvement as a core component in an interdisciplinary model of care and benchmark this data against other published chronic wound service outcomes with the same model of care.

Method: A journal search was completed to find any published research articles that were most similar in nature to our service model, with published rates of healing. The results of this published data were then compared to our healing rates.

Results: One comparison paper (Gohel, Taylor, Earnshaw *et al.* 2005) was identified. A comparison of the two models of care shows that both models of care have similar outcomes for our sample. The comparison study reported that 76% of clients were discharged healed at their standardised endpoint of 24 weeks. In comparison, the Craigieburn Chronic Wound Service reported in this paper had 72% of clients discharged healed with an average time to heal of 12.1 weeks over the sample period (July 2007 to October 2008).

Conclusion: Benchmarking against published data for a similar patient population, the Craigieburn Chronic Wound Service clinic population appears to have a comparable time to heal. However, additional comparative studies are needed to fully assess the effectiveness of the interdisciplinary model of care. This pilot data is an initial step to developing a formal study of the service model and to identify suitable services with which to prospectively benchmark overall healing rates and patient outcomes.

Key words: Interdisciplinary, chronic wound service, leg ulceration

Literature review

Chronic and complex wounds often have prolonged healing times and require frequent assessment and treatment from a health care professional. The recognised definition of a "chronic wound" is that "a wound either fails to proceed through an orderly and timely process to produce anatomic and functional integrity or proceed through the repair process without establishing a sustainable anatomic and functional result"[1]. As wound care becomes more common and known about, this will create a need for the health care systems around the world to put increased funding and resources into the treatment of chronic wounds; the costs of which have been estimated worldwide at US$7 billion[2].

Tim Butters B Pod
Northern Health, Craigieburn Health Service, 350 Craigieburn Road, Cragieburn 3064
Tel (03) 8338 3000
Email tim.butters@nh.org.au

An example of this increased cost is reported in Germany where their rising ageing population will place increased pressure on their already stressed social security system. Of their 4.5 million people treated with chronic wounds per year, this is reported as costing their health care system five billion Euro and this could double within the next 30 years[3].

In comparison, there are over 250,000 Australians with chronic wounds and it is estimated that many are receiving suboptimal care[4]. Healing and management of these chronic wounds is the second most billed Medicare item number in Australia[4].

Some of the reported effects on the health of the population with chronic leg ulcerations are related to severe and continuous pain, which has been reported in Australia to affect 17–65% of this population. There is also the effect of isolation due to the stigma of having unsightly wounds and bandages that can result in the inability to move around comfortably due to the pain. These negative results can also have a lasting impact on quality of sleep, depression, anxiety levels and emotion levels[5].

Traditionally, chronic wounds have been treated in a multidisciplinary model of service. As described in previous articles, these have been predominantly nurse-led and podiatry involvement has been referred to on an as-needed basis[1,6-12]. In contrast to the multidisciplinary approach reported in these studies, an interdisciplinary approach to chronic wound service (CWS) management and treatment at our health service [Craigieburn Health Service (CHS)] has been initiated as the management model. Interdisciplinary teamwork can be contrasted with multidisciplinary teamwork. Multidisciplinary team members work sequentially where the medical record is the chief means of communication. Interdisciplinary teams work collaboratively with regular meetings to discuss patient status and the evolving plan of care. Working as a team allows for: working for common goals; pooling of expertise; a forum for problem-solving; opportunities for personal growth and development; and shared burden and personal support, particularly for professional self-care. An interdisciplinary approach provides capacity for genuine skills transfer through learning, implementing and refining skills across disciplines[13]. Shared decision-making and flexible leadership characterises interdisciplinary teamwork. The team has an identity that is separate from the identities of individual team members[14].

There is literature suggesting that podiatrists are becoming more involved with the care and treatment of people who have "high-risk" chronic foot wounds[7-10,15]. In diabetes patients the term "high-risk" was coined to show that the:

> *... lower limb is at increased risk of infection, ulceration and/or destruction of deep tissues associated with the general pathophysiological process of the client's underlying systemic or localised condition[16].*

Clinical podiatrists have been core members of the clinic team in high-risk foot care services at a number of tertiary institutions and are seen as valuable team members in assisting with achievement of key, long-term outcomes for these clients. The establishment of these clinics has shown reduction in wound healing time, increased percentage of healed ulcers, diminished incidence of amputation and improved prognosis for limb salvage[17]. These high-risk foot services are now within all major hospitals within Melbourne, Victoria, Australia.

Interdisciplinary wound care services with regular podiatric involvement constitute a new and relatively unexplored model of care. Many other CWS models of care are nurse-led, with medical and allied health interventions sought on an as-needed basis. As with most of the services, nursing staff have advanced wound knowledge and skills, they liaise closely with community nursing (Royal District Nursing Service [RDNS] Victorian Branch) and educate clients and their carers on their treatment regime.

Podiatrists offer a diverse range of skills including sharp debridement, knowledge of biomechanics, footwear modification and education, general wound management/treatment, as well as neurovascular assessment, ankle brachial pressure indices and toe pressure measurement.

As part of the quality improvement process of the CWS at CHS, clinical data on a sample of clients has been evaluated and reviewed. The aim of this study was to determine preliminary outcomes for clients attending a CWS with podiatry involvement as a core component in an interdisciplinary model of care and benchmark this data against other published CWS outcomes with the same model of care.

Methodology

Description of clinic

The CWS at CHS, Northern Health, has evolved from the previously named Integrated Wound Management Service. The service runs two days a week and is staffed by a Division 1 nurse and a podiatrist with a half-day medical support (geriatrician). The service is accessed by people living in Craigieburn and the outer northern district of Melbourne.

The criteria for referral to the CWS are that a wound has to have been present for greater than six weeks and the wounds can be to any area of the body.

For the sample population of clients with leg wounds, this population can be treated with compression if their arterial assessments show that this is a valid treatment option. Clients may be treated with bandaging and/or compression stockings.

The service model and location allows clients who would have travelled a considerable distance or only seen their general practitioner (GP), access to further and advanced wound treatments more locally. Clients are assessed jointly by the nurse and podiatrist at the first appointment and medical involvement is determined at this appointment or following subsequent reviews. The service is a wound treatment and monitoring clinic and holistic advice is given to the client about their wound and general medical management. A thorough patient assessment is completed (medical history, history of wound, wound measurement, wound tracings [Visitrak system (Smith and Nephew)], neurovascular assessment, ankle brachial indices and toe pressures, photographic log and debridement). As well

as the above process, the podiatrist assesses the client's footwear, redistributes pressure from wound areas, completes neurovascular assessments and debridement of wounds as required. A wound management instruction letter is provided to the client and/or their interim wound carer after each visit (family GP, RDNS referral or themselves). Any wound dressings applied at the appointment are considered part of the treatment and no cost is incurred. Ongoing dressings are sourced by the interim carer. This could be through their local GP or RDNS provider. Information can also be provided on establishing a wound product account through a wound dressing supply company, where the dressings required can be purchased at a discounted rate and home delivery can be organised.

Data collection

Data for clients attending the Craigieburn CWS between July 2007 (the new service inception date) and October 2008 were retrieved retrospectively from the medical records. The data included: date of admission; date of discharge (if applicable); length of episode (days); and outcome. Outcome measures used were: healed at discharge; referral to another service; and deceased. Healing was then compared to available published data.

Data analysis

Our data set was then analysed and compared to available published data, which was sourced through an online journal database search engine (CINAHL). After completing a thorough search for an appropriate published journal article to benchmark our service against, one appropriate article was identified and this is outlined below. Of all the articles found this was the one that was most similar in nature to our service model. The search strategy was completed using search terms: chronic wound or ulcer linked with interdisciplinary and/or multidisciplinary. Inclusion criteria for article selection were those that were published within the last 10 years, English, full text available and had relevant treatment outcomes. Following these search parameters the articles (eight) were then reviewed for relevance to the CHS CWS model of care and one was chosen to benchmark treatment outcomes against.

Comparable article outline

The Gohel, Taylor, Earnshaw *et al.*[17] study aimed to assess whether a number of routinely assessed variables could be used to predict wound healing and recurrence in patients with chronic venous leg ulceration. They reviewed the outcomes of all of their new patients presenting with leg ulcers between January 1998 and July 2003.

The authors reported on a Gloucestershire, UK-based leg ulcer service. Clients with open or recently healed leg ulceration of >4 weeks duration and an Ankle Brachial Pressure Index (ABPI) >0.85 were included in the study. Initial assessment, healing and recurrence dates were recorded on a computerised spreadsheet. Data was analysed via the Kaplan-Meier survival analyses and the specific risk factors for re-ulceration were assessed using the Cox regression proportional hazard model.

Two thousand two hundred and eighty-three legs were assessed, of these 959 legs were excluded from the study for reasons of: co-existent arterial disease (406), absence of follow-up information (444) or lack of ABPI/duplex investigations (109). After the final inclusion criteria of an ABPI >0.85 was met, a final study population of 1195 legs were included for the ulcer recurrence analysis.

Results

A total of 45 males and 29 females (n=74; Figure 1) attended the CHS CWS during the audit period. The mean age for males was 65 years (range 42–90) and for females 71 years (range 37–90).

Figure 1. Age and gender of clients who attended the CWS.

Overall presentations

Wound location was classified as: (1) wounds on the foot were those located distally from the proximal edge of the malleoli: and (2) those on the leg were those located proximal from the proximal aspect of the malleoli. From our study population: 31 (41.9%) clients presented with leg ulceration, 29 (39.2%) with foot ulceration, 12 (16.2%) with multiple wound sites and 2 (2.7%) with upper body wounds (Figure 2).

The comorbidities and medical history of these clients with healed wounds varied and are outlined in Table 1.

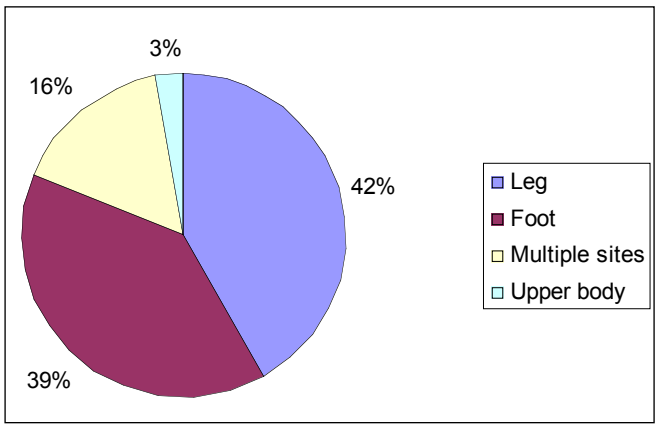

Figure 2. Number of wounds by location.

Treatment and management

Following initial assessments, we created a treatment plan that was client-focused. Initial assessment included blood pressure, pulse, record of diabetes control, Ankle brachial indices, toe pressures (when appropriate), calf and ankle circumferences, temperature of limb and description of wound site.

If further medical assessment or intervention was required, the client was referred to the geriatrician.

Thirty-two clients had wounds that were healed at discharge (43.2%), six died while on the clinic list prior to discharge (8.1%), 13 were discharged to other services (such as nursing homes) (17.6%) and 23 (31.1%) were non-healed (Figure 3).

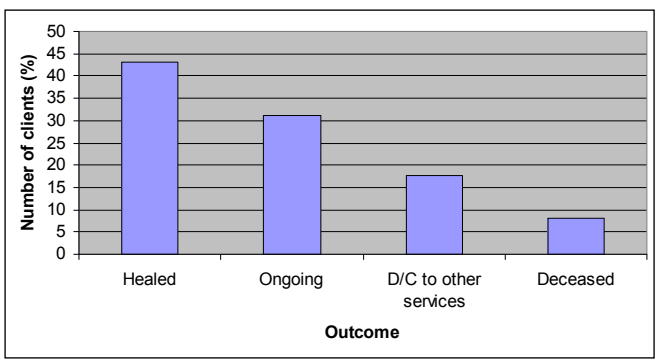

Figure 3. Client wound status outcomes.

CWS sample and outcomes of healing

In order to enable comparison of outcomes with the Gohel, Taylor, Earnshaw *et al.*[17] study, which only included patients with leg ulcerations, a subgroup of the overall Craigieburn CWS population (n=74) with leg ulcerations (25 clients) treated between July 2007 and August 2008, was evaluated as per the method discussed above. Of the 25 clients, 72% of these clients have now been discharged healed with an average time to heal of 12.1 weeks. The 28% of clients that were non-healed following this period continued with the service until healed.

Comparison of outcome measures between CWS model and Gohel, Taylor, Earnshaw *et al.* research findings

A comparison of the two models of care shows that both models of care have variable outcomes. The Gohel, Taylor, Earnshaw *et al.*[17] study shows that 76% of clients were discharged healed at the end of their 24-week research period. In comparison, the Craigieburn CWS had 72% of clients discharged healed with an average time to heal of 12.1 weeks (mean 87.1 95% CI 61.4–112.9) over our research period. Other comparative population data is shown in Table 1.

Discussion

As the results above show, both services vary in outcomes when compared with their outcome relating to proportion of clients discharged with wounds healed. Key findings from the project show that the CWS interdisciplinary model of care has a moderate to high rate of healing, with a relatively short time to heal in an out-patient service when compared to that of the Gohel, Taylor, Earnshaw *et al.* study. The healing rate is comparable between the Craigieburn CWS and the comparison service, but has a shorter length of stay when compared with Gohel, Taylor, Earnshaw *et al.* study[17].

A factor influencing the comparison of the two service outcomes was sample size. The CHS CWS study's small sample size influenced the outcome measures. Gohel, Taylor, Earnshaw *et al.*[17] had a much larger sample size (1324 legs). But in order to allow meaningful comparison (as the Gohel study only evaluated outcome results for the leg ulcerations), the CHS CWS study sample was limited to a sub-sample to match the leg wound criteria. Another limitation for the study is the sample time frame in that clients may have only just entered the service at the time of data collection, thus being classed as a non-healer. Also some of the client sample may have had their wound for a number of months or years prior to entering the service.

The presence of a chronic or recurring wound for an unknown period of time prior to engagement in the service may have resulted in a greater time for the wound to heal. Comparison of the two studies' overall populations shows that a higher percentage of clients attending the Craigieburn CWS had diabetes cited in their medical history; 36 (48.6%) and 129 (10.8%) of clients in the Craigieburn CWS and the Gohel, Taylor, Earnshaw *et al.*[17] study respectively.

Exclusion criteria from the Gohel, Taylor, Earnshaw *et al.*[17] study, as listed above, meant that their sample may have

Table 1. Comparative medical history identified in clients from both studies.

Comparative data	Craigieburn CWS	Gohel study
Gender (M/F)	47/28	508/687
Diabetes mellitus	36 (48.6%)	129 (10.8%)
Hypertensive heart disease	43 (58.1%)	-
Two or more comorbidities (including diabetes, arthritis, hypertensive heat disease or respiratory disorders)	47 (63.5%)	-

influenced their result. As an example from their population those clients with arterial disease (42% of participants) were excluded from their overall analysed sample group. Due to the fact that the CHS CWS sample was small, there were no exclusion criteria, meaning that the analysed sample may have included these particular clients with arterial disease.

The other major difference within the criteria for treatment of leg wounds is that leg wounds treated in the Craigieburn CWS may have had either bandaging compression or class II compression garments as part of their ongoing treatment plan as well as maintenance, following healing. This is a difference between the two study populations as the Gohel, Taylor, Earnshaw *et al.*[17] study only used the above mentioned compression following ulcer healing for maintenance.

A limitation of this study is that we did not retrieve detailed data on all of the demographic and medical history. By listing this it may help readers to best benchmark their population against the study. Further research into the area of service model outcomes from chronic wound services would allow clinicians to further develop their treatments and benchmarking.

Conclusion

In benchmarking against published data for a similar patient population, the interdisciplinary CHS CWS clinic population appears to have a comparable time for wound healing. However, further studies are needed to fully assess the effectiveness and impact of the interdisciplinary model of care. This pilot data is an initial step to developing a formal study of the CHS CWS service model and to identify suitable services, with which to prospectively benchmark overall healing rates and patient outcomes.

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