STAR: a consensus for skin tear classification

Carville K, Lewin G, Newall N, Haslehurst P, Michael R, Santamaria N & Roberts P

Abstract

Until now the Payne-Martin Classification System for Skin Tears has been the only skin tear classification system reported in the literature. Considering that the development of this taxonomy began over twenty years ago, it is rather puzzling that it has been poorly utilised in Australia. Especially in light of the fact that skin tears are perceived to be common wounds amongst frail older or disabled persons [1, 2, 3] and their prevalence can be expected to escalate in line with our ageing population. Stage one of the Skin Tear Audit Research (STAR) study aimed to gain a consensus from Australian nurse experts in wound management on a classification system for skin tears and to test the reliability of the resulting classification system. This paper reports on the processes undertaken to achieve a consensus, the STAR Skin Tear Classification System that resulted, and the reliability testing that it underwent.

Carville K, RN PhD *
Associate Professor Domiciliary Nursing
Silver Chain and Curtin University of Technology
6 Sundercombe Street, Osborne Park WA 6017
Tel: (08) 9242 0242
Email: kcarville@silverchain.org.au

Lewin G, PhD MPH
Research Manager, Silver Chain
Adjunct Associate Professor
Curtin University of Technology
Adjunct Senior Lecturer, Edith Cowan University

Newall N, RN
Clinical Research Coordinator, Silver Chain

Haslehurst P, BBus (Hons)
Senior Business Development Analyst
Silver Chain

Michael R
Associate Professor, Director Post-graduate
Studies, School of Nursing and Midwifery
Curtin University of Technology

Santamaria N
Professor, Chair of Acute and Ambulatory care,
School of Nursing and Midwifery
Curtin University of Technology

Roberts P
Senior Lecturer, Director of Centre for
International and Professional Education
School of Nursing and Midwifery,
Curtin University of Technology

* Corresponding author

Introduction

Skin tears are perceived to be common wounds amongst frail older or disabled persons [1, 2, 3]. However, these wounds go largely unreported, especially in the community [2, 4, 5] and there is a dearth of published data on prevalence and incidence of skin tears in Australia. Although several authors have emphasised the need to assess the degree of wounding when a skin tear occurs [1, 2, 5, 6] until now only Payne and Martin [7, 8] have proposed a taxonomy for classification of skin tears. The Payne-Martin Classification System for Skin Tears was devised as a result of a pilot study in 1985 and a descriptive study in 1990 [7]. The definitions used in the classification system were refined in 1993 [8]. However, this classification system has been poorly utilised in Australia and it is not clear whether the reason for this is lack of awareness amongst clinicians or because of problems with the classification system itself.

It was the lack of data on skin tears in older people that prompted researchers from Silver Chain and Curtin University of Technology to develop a research partnership to fill this gap. However, it was quickly realised that an essential prerequisite for conducting either a prevalence or incidence study is the availability of an accepted classification system that can be used reliably by different individuals working in different health and aged care settings. Therefore, the aim of the first stage of the project was identified as the development of a universally acceptable and valid skin tear classification system. This paper reports on the first stage of what is conceived ultimately to be a five stage project that will examine the prevalence of skin tears and then develop, implement, and evaluate the effectiveness of guidelines for their prevention and management.

Background

Consensus for a universal definition and staging system for pressure ulcers has resulted in an effective framework for the development of national and international guidelines for the prevention, prediction, assessment and management of pressure ulcers [9, 10, 11]. The use of an internationally accepted common language and staging system has facilitated best practice and research within this domain. Analogies can also be made with burn wounds and the evident clinical advantages that result from the use of standardised definitions and assessment systems for burn management.

Skin tears are perceived to be extremely common wounds [1, 2, 3] and reported to be more common than pressure ulcers and burns in some prevalence studies [4, 13, 24]. However, there is currently no universally accepted definition of a skin tear, nor a system for classifying them. The most commonly cited definition of a skin tear is that proposed by Payne and Martin [8] which states that a skin tear is:

> *a traumatic wound occurring principally on the extremities of older adults, as a result of friction alone or shearing and friction forces which separate the epidermis from the dermis (partial thickness wound) or which separate both the epidermis and the dermis from underlying structures (full thickness wound)* [8, p.20].

Several variations of this definition are found in the literature [2, 14, 15, 16] and this has the potential to confuse both registered and unlicensed health care providers. It is envisaged that a consensus for skin tear terminology and staging will facilitate understanding, care planning and analysis of care outcomes.

However defined, skin tears are most commonly found amongst frail older or disabled people [17]. Reasons for this are related to the range of pathophysiological changes that occur in ageing skin and the increased incidence of falls and manual handling requirements amongst elderly frail or disabled persons [3, 14]. Other risk factors for acquiring skin tears identified in the literature are visual impairment, impaired mobility or balance, altered mental status and changes in skin condition due to the use of certain medications such as steroids or anticoagulants [1, 5, 16, 18, 19, 20, 21]. Regardless of the cause, any disruption in skin integrity predisposes to infection, physical and emotional discomfort and an increase utilisation of health care resources.

Australia's population aged 65 years and over was reported to be 12% in 1997 and is expected to increase to 18% in 2021 and 26% in 2051 [22]. Furthermore, the proportion of persons aged 85 years and over will increase from 1.2% in 1997 to 4.4% - 4.8% in 2051 [22]. In the four years from 2007 the growth rate in persons aged 65 years and over will begin to escalate dramatically as the first of the baby boomers turn 65 in 2011 [22, 23]. Fiscal constraints and the potential health demands of an ageing population stimulated a *National Strategy for an Ageing Australia* [22]. Amongst the ageing reforms outlined in this document is a call for greater cost-effectiveness in health and long-term care and the development of strategies for care of frail older people. The development of systems and strategies for determining the prediction, prevention, assessment and management of skin tears is in keeping with this challenge.

Epidemiological data on the incidence and prevalence of skin tears is relatively rare and national figures are not available. In one aged care facility in the United States, an incidence rate of 0.92% per resident per year was reported [2], whilst another 120 bed facility found 16% of their population sustained skin tears each month [3]. In Australia, Everett and Powell [1] found skin tears constituted 41.5% of known wounds amongst residents (with an average age of 80 years) in a 347 bed Western Australian (WA) long-term care facility. In 1992 this same facility found that 22 skin tears occurred on average each month amongst persons with a mean age of 80 years [1]. In 1996, Carville and Lewin [24] conducted a wound audit within a WA community setting and found 5.5% of the known wounds, amongst clients of all ages, were skin tears on anatomical sites other than the lower leg. Skin tears on the lower leg were classified as leg ulcers when associated with chronic healing or underlying vascular pathophysiology. In a similar audit conducted by the same agency between November 1999 and April 2000 amongst Department of Veterans Affairs (DVA) clients with wounds, who were predominately aged 70 years or older, skin tears were found to be 20% of known wounds [4]. A survey of forty-four aged care facilities was conducted in Melbourne in 2000 and revealed skin tears to be the most common wound (54%) when compared with pressure ulcers and leg ulcers [13], whilst a WA tertiary hospital reported in 1993 a prevalence of 9.1% in a population with a mean age of 83 years [25]. Even limited findings such as these, demonstrate a need for a national consensus in skin tear terminology and classification.

Until now the Payne-Martin system [7, 8] has been the only classification system for skin tears reported in the literature. It was previously pointed out that this classification system originated from a pilot study that was conducted in 1985 and a 1990 descriptive study. In the latter study, ten "non-critically ill" persons aged 55 years and over were recruited from eight residential aged care facilities and amongst them

they had thirty-one skin tears [7, p.28]. The resultant classification system and associated definitions were devised "deductively from serial wound (subject) assessments and photographic histories" [8, p.18]. The classification system comprised three categories and five types of skin tears in accordance with the morphological characteristics of the presenting epidermal injury.

In 1993, Payne and Martin published a critique of their own classification system and acknowledged concerns in regard to their earlier definitions that arose as a result of recognised advances in wound care knowledge and experience [8]. They proposed a revised definition of a skin tear *per se* and the definitions used within the classification system to define the categories and sub-categories of epidermal injury. These authors asserted that their classification system was a taxonomy, that is a "science of classification" and that classification is the grouping of "phenomena into categories based on defining characteristics that describe their similarities and relationships" [8, p.17]. Moreover, Payne and Martin proposed that three criteria are applicable for evaluating classification systems and they are: internal validity, external validity and utility [8].

The authors claimed their classification system demonstrated internal and external validity. However, they voiced concerns in regard to its utility, which relates to the usefulness of a skin tear classification system amongst clinicians and care givers. Payne and Martin criticised other authors for not utilising their definition and classification system, yet offered no explanation as to why they perceived this was the case [8]. On the other hand, White [5] found there existed a lack of awareness of the Payne-Martin classification system amongst Australian registered nurses employed in aged care facilities. The Australian literature and anecdotal data reflects a lack of utilisation in other Australian health settings. Anecdotal data also suggested that nurses experienced in wound management had concerns in regard to the lack of research being conducted into skin tears and the lack of evidence-based guidelines to direct their assessment and management. The STAR project was designed to take up this challenge and the participants in this project are encouraged by Payne and Martin's decree that their classification system should undergo a "continuous process of reiterating, expanding, deleting, revising, and refining of concepts" [8, p.17].

Project aim

To develop a universally acceptable and valid skin tear classification system.

Objectives

To achieve its aim the project had two specific research objectives:

1. To gain agreement from Australian nurse experts in wound management on a classification of skin tears.
2. To test the reliability of the resulting classification system.

Ethical considerations

Ethical approval for the study was obtained from Silver Chain and Curtin University Human Research Ethics Committees. Ethical approval to collect photographs for the photographic library was also sought and obtained from the executive officers or ethical committees of three WA tertiary hospitals and participating aged care facilities.

Methods

Project design

The methods used to address the two research objectives are shown in Table 1. The key elements of the design, the difficulties encountered and the further iteration of the design elements that was found to be necessary are then described in detail.

Table 1.

Study objectives	Study methods
Gain agreement on a classification	Using a library of photographs of skin tears, Payne-Martin classification revised by Development Group through a consensus process. Resulting classification tested, reviewed and further refined by National Expert Panel.
Test the reliability of the classification	Registered nurses working in different settings independently classify set of photographs.

Skin tear photograph library

A library of skin tear photographs was established. Using all available contacts and frequent follow-ups, as many skin tear photographs as possible were sourced from acute, subacute, aged care and community settings. While the intention was to recruit only good quality photographs that clearly demonstrated the diversity of skin tear characteristics, the paucity of examples of certain categories of skin tears meant that it was necessary to include some relatively poor quality photographs. In particular, it proved to be difficult

to source photographs of relatively minor skin tears or those not associated with skin colour changes. The difficulties encountered in collecting sufficient numbers of good quality photographs delayed for several months the process of achieving a consensus on a classification system.

Prior to the collection of skin tear photographs all participating agencies and individuals were provided with an Information statement for residents, clients and patients. This form outlined the aims and objectives of the study and the manner in which the photographs would be used and confidentiality would be maintained. A consent form accompanied the Information statement and each person with a skin tear or their authorised representative was asked to give written approval for use of the photograph. Photographs that had previously been taken with informed consent and that were the property of wound practitioners or health care agencies were accepted into the library when copyright was assigned to the STAR project.

Development group

Nine clinical nurse consultants or specialists with particular knowledge and experience in skin tears and who worked in a variety of clinical settings in WA, were invited to participate in this group together with the lead clinical investigator on the project. Seven of the nine nurses who were approached were available to attend on the dates nominated for the workshops. The group was organised and facilitated by the project officer.

National expert panel

Fourteen nationally recognised wound care experts, at least one from each Australian state, were invited to participate on this panel. While everyone who was approached was eager to participate only eleven were available for all of the teleconference dates and they made up the panel.

Gaining agreement on a skin tear classification

The consensus development process was undertaken in two stages. The state development group was to achieve a consensus for a classification system and the proposed tool would then be referred to the national expert panel for review and refinement if that group considered it necessary.

The starting point for the state group was review of the Payne-Martin classification system. The development group members were provided with copies of the original paper [7] plus other relevant articles [1, 2, 3, 5, 7, 18, 21] as pre-reading in preparation for the first workshop. The workshop began with a brief overview on the purpose of the study and a classification system, and

was followed by a detailed description of the definitions of a skin tear and each of the categories used in the Payne-Martin system. The group decided that the definition of a skin tear as proposed by Payne and Martin [8] compared favourably with the descriptors found in the broader literature and decided that they would use this definition for the purpose of stage one of the STAR study. The intention is to review this definition after stage two, which proposes to use the agreed classification in a prevalence survey of skin tears in WA.

Twenty skin tear photographs were then projected onto a screen and each member of the group was asked to independently classify them using Payne-Martin classification. Once the independent classification process was complete, the group compared the classification awarded each skin tear photograph by each group member. When there was any disagreement between group members in regard to the category to which they had assigned a photograph, the project officer directed the group to discuss the variables that influenced their different categorisations. This process identified the critical sources of confusion between the categories and led to a consensus that modifications to the classification system were necessary.

The second and third workshops (each workshop was one week apart) consisted of three further iterations of the above process, each time using the most recent version of the classification and different sets of photographs. It took four iterations to develop a tool with descriptive categories that the group was happy with and which achieved a high level of agreement when used to classify the photographs. The definitions for each category in the modified classification were then documented as the version to be distributed to the national expert panel for further validation.

The revised classification and category definitions were then sent electronically to the national expert panel. They were also sent a set of twenty photographs and asked to classify them using the revised classification. They were provided with a record sheet on which they were asked to record: the category that they assigned each photograph to; the degree of certainty they felt in making this classification; if they were at all uncertain, what their uncertainty related to. They were requested to complete and return the record sheet by the end of the week so that the results could be collated and distributed to them prior to the teleconference. The results of this process were then summarised into a document, which showed how each photograph had been classified and what issues had been identified in relation to each. The

group discussed how these issues might be addressed and decided that it was not necessary to make further changes to the classification system, but rather to add some explanatory notes and a glossary of terms. These were subsequently drafted by the project team and circulated electronically to the national expert panel for review. Individual panel members then suggested further refinements and the process was continued until consensus on the wording of the notes and the glossary was achieved. The resulting classification system described the five skin tear categories and outlined some of the concepts used in the descriptions in a glossary of terms. This document was then used in the reliability testing.

Reliability testing

The reliability of the classification system was tested by a group of twenty-six registered nurses who were recruited via advertisements in the West Australian Wound Care Association Newsletter and aged care peak body newsletters, flyers at conferences and word-of-mouth. None of the nurses had been involved in any of the previous stages of the project and all were currently employed in acute, community or residential aged care facilities.

The recruited nurses underwent training in the use of the classification system and were provided with a copy of the tool that had been developed. They were then asked to classify twenty-five photographs of skin tears. The numbers of photographs representing each category of skin tear were unequal as good quality photographs of some types of tears proved very difficult to source. However, the categories over-represented in the sample were those categories which, in the development process, were found to be most difficult to satisfactorily distinguish. Conversely, it was those categories where there was little misclassification during development that had the smallest numbers.

The results of the reliability testing were analysed using Cohen's Kappa statistic which estimates the level of agreement between raters beyond that which would be expected to have occurred by chance. This was estimated for each of the photographs. The results were disappointing as they indicated that there was a significant amount of misclassification relating to one of the categories in particular, and that for this category there was also little agreement between raters as to what other category the skin tear belonged to.

Subsequent consideration by the project team of the classification errors made, led to the hypothesis that nurses were trying to bring their clinical experience to bear on the decision they were being asked to make, rather than simply relying on the classification definitions supplied, and that this was reducing the likelihood of agreement. This hypothesis was then tested by repeating the reliability test with ten non-nurse Silver Chain office staff. However, this test did not provide any support for our hypothesis. Therefore, it was decided that a further refinement of the classification system was needed and that we should go through further iterations of the development process until we had a classification that worked.

Repeating the process

The development group was reconvened and this time the starting point was the refined version of the Payne-Martin classification system [7, 8], which by this time had been renamed the STAR Classification System (the name change had been suggested by the national expert panel as they considered that the new classification was sufficiently different from the original to warrant a change of name, and STAR was the project's acronym – Skin Tear Audit Research). On this occasion, rather than repeat the procedure followed in earlier workshops when the participants used the tool to classify photographs and then discussed their own results, the group examined the results of the reliability testing that was conducted with both the non-expert nurses and the non-nurses. The development group's conclusions were that the wording used to describe each category rather than the characteristics of each category, needed modification. The group decided that the use of simple descriptions and a photographic example of each skin tear category on the tool would lead to less confusion. The developmental group then worked together until they reached consensus on 'simple' or lay descriptions for each category of skin tear. The project team then designed a new STAR classification tool that combined these descriptions with the best photographs from the library for each category of tear. This tool was then sent out to the development group for review and sign off.

The opinions of the national expert panel on the new tool were then sought via a teleconference. Prior to the teleconference they were sent both a copy of the revised STAR tool and a small set of photographs to validate it against. The national expert panel was in complete agreement with the modifications that had been made to the tool and after making a couple of very minor edits to the descriptions fully endorsed the document.

The reliability of the classification was then tested again. This time, rather than have nurses from different settings come together for one testing session, three separate sessions were conducted in different clinical settings – a tertiary hospital,

a community nursing service and an aged care residential facility. The procedure followed for all three sessions mirrored exactly the procedure that had been followed in the original reliability testing. The only difference was that the modified classification tool was used by the nurses to help them classify the skin tears in the reliability testing procedure. Thirty-six nurses in total took part in the testing sessions – sixteen worked in acute care, ten worked in the community and ten worked in residential aged care.

The results of this second reliability testing process were again analysed using Cohen's Kappa Statistic. This time the level of agreement was sufficiently high to indicate that the development process had been completed successfully and that no further iterations of the process were needed.

Results

The results of the second reliability test showed that the level of agreement on the category for each skin tear photograph ranged between 83% and 97%, and that the overall agreement for the set of photographs was 93%. All except one category achieved an overall agreement of more than 90%, the agreement for photographs in this latter category averaged 85%.

The results for the photographs that were common to the two reliability tests were also examined (only some of the photographs were used in both tests as some were replaced with better quality photographs that became available after the first test). This examination showed that the two photographs used in both tests had very poor agreement in the first test (50% or below) but were classified with 83% and 89% agreement in the second test.

Discussion

Achieving a consensus

The development of the STAR Classification System and the agreement obtained in the reliability testing outlined in this paper, is evidence that the objectives of this stage of the study were achieved. The use of a consensus development process amongst Australian nurses who are considered by the nature of their employment position and professional standing to be experts in wound management, proved successful. The project team is indebted to these nurses for their commitment, enthusiasm and contributions to the development of the STAR Classification System. Although it proved to be a lengthy process, their enthusiasm did not wane. The project team is also indebted to the nurses who were recruited

from the acute, community and aged care facilities for their participation in the reliability testing. Furthermore, we extend the same appreciation to the ten non-nurse participants who proved invalid our hypothesis that nurses were bringing their clinical experience to bear on their classification decisions.

The STAR Classification System identifies five categories of skin tear (1a, 1b, 2a, 2b and 3) as outlined in Figure 1. The aim was to produce a classification system that was simple and easy to use across all health and aged care settings and by all licensed health professionals and non-licensed carers. The STAR Classification System aims to address identified deficits or confusing variables in the Payne-Martin system. Both the STAR development group and the national expert panel identified concerns in regard to skin tear assessment, management and determining anticipated outcomes when haematoma or ischaemia was associated with a skin tear. Payne and Martin [7, 8] and most other authors on the topic [2, 3, 18, 19, 21] have observed that skin tears occur more commonly in aged skin, in particular that affected by pre-existing vascular lesions or ecchymosis.

However, there is a dearth of comment in the literature as to the impact of incident-related haematoma and tissue hypoxia in the remnant flap or realigned skin, and the challenges these complications present for tissue viability. The STAR Classification System assesses the skin and any remnant flap for haematoma and ischaemia, which could affect tissue viability. Both the development group and the national expert panel ranked tissue viability of the flap or realigned skin of the utmost importance and agreed that tissue viability was a strong influencing factor for determining management decisions. The terms used for assessment of tissue viability are deliberately simplified: for example, category 1b is: 'A skin tear where the edges can be realigned to the normal anatomical position (without undue stretching) and the skin or flap colour is pale, dusky or darkened' when compared to the individual's 'normal' surrounding skin. The first round of reliability testing conducted amongst nurses who were not identified to be experts in wound management, failed to achieve agreement in classifying skin tears when more technical language was used on the tool. Agreement was achieved in the second round of testing amongst non-expert nurses in the acute, community and aged care settings when the language and terms were simplified. This finding has relevance to the utility of the tool amongst non-licensed health care workers, particularly in the aged care setting.

A second concern identified by the development group and the national expert panel members was the ability of all health workers to objectively and accurately assess the degree of tissue loss or separation as outlined in the Payne-Martin classification. Descriptors used in the Payne-Martin classification to describe tissue loss, such as 'scant' or 'moderate to large tissue loss' were found to be ambiguous [8]. Even Payne and Martin considered this to be the case when they revised their definitions and classification in 1993 [8]. Once again, the STAR consensus was to simplify the parameters of assessment and a category 1a or 1b skin tear is one 'where the edges **can** be realigned to the normal anatomical position (without undue stretching)'. A category 2a or 2b skin tear presents 'where the edges **cannot** be realigned to the normal anatomical position (without undue stretching)'.

Neither STAR group considered it necessary to separate linear and flap skin tears into different categories if the skin or flap could be realigned without tissue loss. This feature highlights another difference between STAR and the Payne-Martin system. As is the case with the Payne-Martin system, the STAR system is designed to assess the degree of tissue loss in the same way that a pressure ulcer staging tool would be used. These tools are not meant to be used in isolation, but in conjunction with a comprehensive wound assessment record.

The skin tear photographic library

The difficulties experienced by the project team in establishing a library of quality skin tear photographs for the purpose of the research is outlined above under the 'Methods' section. The difficulties related generally to the nature of the skin tears themselves and the quality of the photographs. The sourcing of relatively minor skin tears or those not associated with incident-related haematoma or ischaemia in the remnant flap or skin, was difficult. This could imply that minor skin tears are not considered problematic and worthy of photographic assessment, or they are in the minority. However, further study is required to determine the validity of these assumptions. In addition, many of the skin tear photographs that were sent to the project team from a variety of sources and facilities were too poor in quality to use in the testing processes. Considering the increased use and reliance on wound photographs in health records, this finding has significant implications for meeting clinical and legal requirements. In an attempt to overcome this problem, the project team provided written information to potential photographic sources that detailed tips for recording quality wound photographs.

The use of two-dimensional photographs for the consensus development and the testing of the STAR Classification System, is in itself a limitation of this study. It is appreciated that comprehensive wound assessment involves inspection, palpation and three-dimensional measurement, as well as the assessment of a number of related wound characteristics that are not necessarily evident in photographs. Further reliability testing of the STAR Classification System will be conducted as a component of skin assessment in an extensive prevalence survey, which is to be conducted across WA later this year.

The library of skin tear photographs is intended for ongoing research and education and will be made available for these purposes to all who contributed to its development. The project team is very appreciative of the commitment and contributions of those who participated in the development of the skin tear library.

Conclusion

Until now the Payne-Martin Classification System for Skin Tears has been the only skin tear classification system reported in the literature. Payne and Martin are to be acknowledged and indeed congratulated, for their seminal taxonomy. However, considering that the development of this taxonomy began over twenty years ago its poor utilisation, especially in Australia, is puzzling. This was of particular concern to the STAR project team considering the fact that skin tears are reported to be the most common wounds found amongst older people and their prevalence can be expected to escalate in line with our ageing population. Stage one of the STAR study was designed to establish a consensus for skin tear classification in order to ensure the availability of a valid tool for ongoing research. The method used in this study to achieve a consensus facilitated national discussion and raised awareness of the need for a universally accepted skin tear classification system. The method has proved to be advantageous and it is anticipated that it has relevance to other research projects. The resultant STAR Classification System was tested and found to be simple and easy to use. Therefore, we feel we have the addressed the issues identified in the Payne and Martin classification system, by the STAR development group and national expert panel.

Acknowledgements

References

1. Everett S & Powell T. Skin tears - The underestimated wound. Primary Intent 1994; **2**:8-30.

2. Malone M, Rozario N, Gavinski M & Goodwin J. The epidemiology of skin tears in the institutionalized elderly. JAGS 1991; **39**:591-595.

3. White M, Karam S & Cowell B. Skin tears in frail elders: A practical approach to prevention. Geriatric Nurs 1994; **15**:95-99.

4. Carville K & Smith JA. Report on the effectiveness of comprehensive wound assessment and documentation in the community. Primary Intent 2004; **12**:41-48.

5. White M. Skin tears: A descriptive study of the opinions, clinical practice and knowledge base of RNs caring for the aged in high care residential facilities. Primary Intent 2001; **9**:138-149.

6. Krasner D. An approach for treating skin tears. Ostomy/Wound Management 1991;32, 56-58.

7. Payne R & Martin M. Skin tears: The epidemiology and management of skin tears in older adults. Ostomy Wound Management 1990; **26**:26-37.

8. Payne R & Martin M. Defining and classifying skin tears: Need for a common language ... a critique and revision of the Payne-Martin classification system for skin tears. Ostomy Wound Management 1993; **39**:16-20.

9. National Pressure Ulcer Advisory Panel. Pressure ulcers: Incidence, economics, risk assessment. Consensus development conference statement. Decubitus 1989; **2**:24-28.

10. European Pressure Ulcer Advisory Panel. Pressure ulcer classification 1998; www.epuap.org/

11. Australian Wound Management Association. Clinical Practice Guidelines for the Prediction and Prevention of Pressure Ulcers. West Leederville WA: Cambridge Publishing, 2001.

12. Sussman G. Wound Healing and Cost Impacts of Interventions by Pharmacists in Community Settings 2004; Monash University. Viewed 6 January 2007 <http://www.vcp.monash.edu.au>.

13. Edwards H, Gaskill D & Nash R. Treating skin tears in nursing home residents: A pilot study comparing four types of dressings. Int J Nurs Prac 1998; **4**:25-32.

14. McErlean B, Sandison S, Muir D, Hutchinson B & Humphreys W. Skin tear prevalence and management at one hospital. Primary Intent 2004; **12**:83-88.

15. Meuleneire F. Using a soft silicone-coated net dressing to manage skin tears. J Wound Care 2002; **11**:365-369.

16. Morey P. Trauma. In: Templeton S (Ed). Wound Care Nursing. Melbourne: Ausmed Publications, 2005:121-132.

17. Baranoski S. Skin tears: Guard against this enemy of frail skin. Nurs Management 2001; **32**:25-32.

18. Bryant RA & Rolstad BS. Examining threats to skin integrity. Ostomy/Wound Management 2001; **47**:18-27.

19. Calliano C. Skin care: Keeping the outside healthy. Nursing 2002; **32** supplement:1-13. Viewed 11 August 2004 <NursingCentre.com> database.

20. McGough-Csarny J & Kopac CA. Objectives 1: Risk factor identification. Skin tears in institutionalized elderly: An epidemiological study. Ostomy Wound Management 1998; **44**:14S-25S, 38S-40S.

21. Bishop B. The National Strategy for an Ageing Australia. Background Paper. Canberra: Commonwealth of Australia 1999; Pub No 2517.

22. Australian Bureau of Statistics. Australian Social Trends 1999; Cat No 4102.0. Canberra: ABS.

23. Carville K & Lewin G. Caring in the community: A wound prevalence study. Primary Intent 1998; **6**:54-62.

24. Morey P. Skin tears, prevalence and treatment. Presented at the joint Western Australia Wound Care Association and Infection Control Association Conference, Perth, 16 September 2003.